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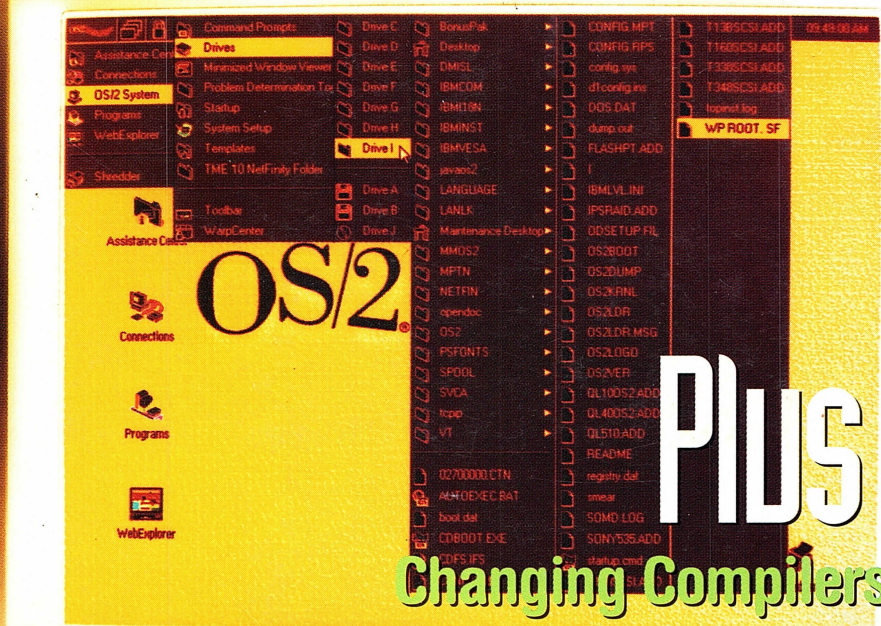
M A G A Z I N E

Reviews

JView Pro
NeuralCrunch/2
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MERLIN

The many
faces of
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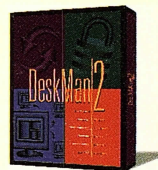
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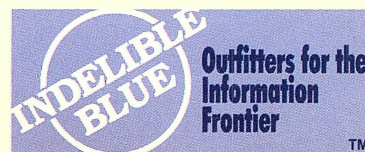
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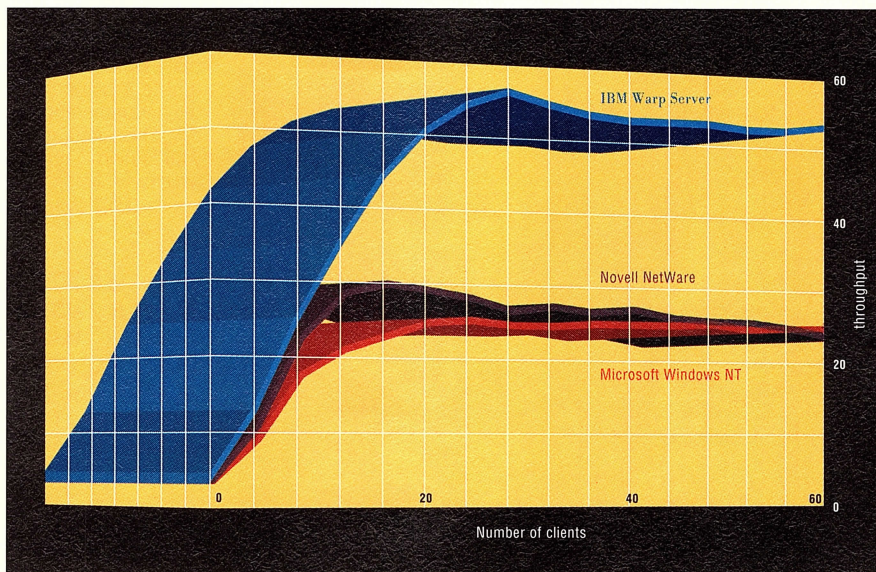
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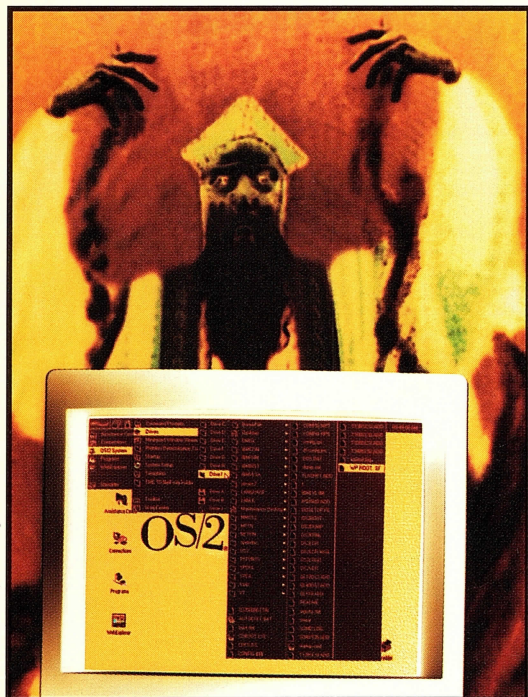
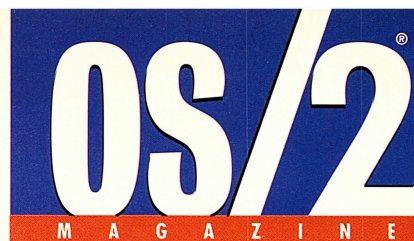


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We also maintain a Web-accessible database of OS/2-related products, the Software Solutions Directory. You can jump to it from our main home page or link to it directly at <http://www.mfi.com/softwareguide>.

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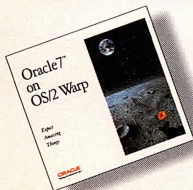
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Perspectives

Post Merlin

Merlin is not the last shot for OS/2." Thus spoke John W. Thompson, general manager of IBM's Personal Software Products (PSP) division. We spoke in early August, about five weeks before the anticipated release of Merlin, a.k.a. OS/2 Warp 4.0.

Mr. Thompson is enthusiastic about IBM's commitment to the present and future success of OS/2. Since mid-1995, PSP has shipped OS/2 Warp Server, the IBM Software Servers, and soon, Merlin. He's set OS/2 back on the right path—killed OS/2 Warp for PowerPC, garnered favorable prelaunch publicity for Merlin's built-in speech-recognition engine. He's also definitively positioned OS/2 as a connected client and server operating system, primarily geared towards IBM's traditional medium- and large-sized corporate customers.

PSP's next challenge, says its general manager, is to attempt to address market perceptions as to the health (or lack thereof) of OS/2 both as a client and server. Merlin is the key—and not because of its VoiceType integration. No, says John Thompson, the real silver bullet is Merlin's first-on-Intel integration with the Internet—specifically, Java support built right into the operating system.

As many of us have heard, IBM has bought into distributed "network computing" in a big way, and OS/2 is a key extension of this strategy. With integrated Java support, the whole issue of OS/2's applications compatibility goes away—if you believe that Internet computing is the way of the future. John Thompson and IBM do. To that end, expect to hear PSP promoting OS/2 Warp 4.0's network-centric functionality: "While Apple and Microsoft talk about living inside a [Web] browser, that doesn't take into account that we've all become accustomed to the desktop, whether it's the WPS, Lotus Notes, or a particular application. [Merlin's Internet integration] is a good first step to a paradigm shift toward living in the browser," says Mr. Thompson. "OS/2 plays in what IBM calls its strategic foreground: standardized HTML, Java, etc."

Thompson on the issues

Why no second beta for Merlin, despite its well-documented problems? According to John Thompson, any second beta would push Merlin well past a third-quarter launch. Although they're working to fix bugs, IBM isn't able to address other beta-feedback issues in the initial Merlin release, such as major continuing problems with the installation procedure. (Other IBM sources report that there will be a small gamma test to several hundred sites before the product launch.)

Why is it so important to ship in 3Q 1996? Although Mr. Thompson insists that "I'd love to fix all things [found in beta testing]," he says that customers and developers need to see that the platform is successful. "It's important that customers give feedback, but Merlin must demonstrate vitality. And that means shipping product."

Will we see Windows 95 application support? Mr. Thompson says that some customers care a great deal about Windows 95 support; he cited an *Info-World* study that said that 50% of OS/2 users want that feature. He says that Open32 (formerly the Developer API Extensions) is the way for developers to directly support OS/2 today, but the future means Java applications, which are inherently cross-platform. "Expect OS/2 to have the most exploiting Java in the industry," he claims.

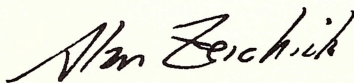
Will there be a Netscape Navigator for OS/2? "We're working like a duck: Calm on top, paddling like hell underneath. [Netscape Navigator] is important."

What's next after Merlin? First, OS/2 Warp SMP Server comes later in 1996, says Mr. Thompson. The follow-on major revision will be a server release that'll do a better job with Java, enhancing security, and more TCP/IP functionality to exploit Internet/intranet applications.

The timeframe? "To be Internet exploitive is all about developing a cadence around the product, with something new every 60 to 90 days—four or five new things by fall 1997." Mr. Thompson's goal is to divide the OS/2 development team into "chunks" that deliver parts of additional functionality right away, without waiting for major revisions to the baseline operating system.

The battle lies ahead

The next six months will be critical for OS/2. It sounds like IBM is learning from past mistakes and false steps; we're optimistic that Personal Software Products has found the right niche and direction for OS/2. On the other hand, Microsoft began shipping Windows NT 4.0 Workstation and Server in late August 1996, and their Internet Explorer 3.0 product is light-years ahead of IBM's WebExplorer. Let's watch and see how well that commitment plays in the competitive marketplace.



Alan Zeichick
Editor-in-Chief





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Letters

"We need to patronize vendors who support our habit."

Internet comments

Dear Editor,

Just a few comments on the article by Steven J. Vaughan-Nichols.

I felt he gave a good overview of connecting up to the Internet, but there are a couple of resources which bear mentioning. The first is an e-mail list for OS/2 Internet Service Providers. While most companies are not looking to join this business, the problems faced are the same. To join the list, send e-mail to listserv@dentat.stat.com. In the body of the message use the following commands:

subscribe os2-isp FirstName LastName

You can get more help by sending an "info" command in the body of the message.

My other point is about the next to last paragraph: "For mail, no Post Office Protocol (POP) servers currently exist." There are actually several POP3 servers available, which will work with sendmail from Warp Connect or Warp Server. Check on <ftp://hobbes.nmsu.edu> (Hobbes).

There will also be one shareware/commercial mail server coming out soon—Inet.Mail for OS/2 from NeoLogic and Hethmon Brothers. It's a complete SMTP/POP3 mail server for OS/2 with a PM interface, no sendmail required. There will be a shareware/demo version limited to 10 users and a commercial version with unlimited users. It also comes with a mailing list processor.

Thanks,

Paul Hethmon
Knoxville, Tenn.

TCP/IP and ISO

Dear Editor,

I'd like to thank Steven J. Gutz for his article, "Connecting to OS/2 Sockets" in the August 1996 issue. I have been considering porting BIND to OS/2 for some time now, and I have long wondered how to find the network pro-

gramming API. Mr. Gutz has taken the mystery out of this subject, and he has my gratitude. (This article's bibliography was of particular interest to me.)

I must offer one simple correction to the article. On page 31, Mr. Gutz states that "TCP/IP was developed using a seven-layer architecture defined by the International Standards Organization, known as... ISO/OSI." The TCP/IP architecture was developed before the ISO model was first published, then in ignorance of the ISO model, and then with open hostility to the ISO model.

I very strongly recommend *The Elements of Networking Style*, M. A. Padlipsky, Prentice-Hall, 1984, ISBN 0-13-268129-3 for those who'd like to study this matter in greater detail.

Paul A Vixie

Zeichick misleading

Dear Editor,

I was a little disappointed in Alan Zeichick's "Perspectives" column in the August 1996 issue. Mr. Zeichick reports on his new-found love of removable cartridge drives, but in the end, provides a disservice to the OS/2 community. Mr. Zeichick needs to be reminded that some individuals look to him and his staff for guidance, and his column left this reader with the impression that the Iomega Zip drive is the only "solution" for removable cartridges under the OS/2 operating system. I have used the Iomega 100MB drive, and it's a fine product. But had Zeichick done a little research into this product sector, he would have discovered the Syquest EZ-135. For about the same money, the EZ-135 offers 23% more disk space, much faster access time than the 100MB Iomega, and significant increase in transfer rate.

But more importantly, the Syquest drive comes with a "Ready for OS/2 Warp" label right on the box. OS/2 drivers are included in the box, the manual has a section on OS/2—in short, this is an OS/2 product, and it

should be brought to the attention of the readers as such.

Instead, Mr. Zeichick praises Iomega for allowing you to download drivers that work in OS/2 (they are not included in the box) or allowing users the option of receiving them by mail for the nominal charge of \$19.55 (which he refers to as an "OS/2 tax").

The point is that if we are going to be OS/2 users, we need to patronize vendors who support our habit. Devoting an entire column to a product that has a true OS/2 alternative without so much as a mention of the competitor's product is not responsible journalism and does a disservice to readers who look to OS/2 Magazine as a source of information to guide their purchasing.

Jon Kaminsky
Tacoma, Washington

Mr. Kaminsky brings up a valid point: that comparative reviews of hardware and software should be all-encompassing. But the truth of the matter is, I chose the Iomega Zip drive for my personal use for several reasons, including the fact that many colleagues used one, many members of my family used one, the price was acceptable, and I could use it directly on all my systems without having to deal with SCSI-to-parallel converters.

It was my choice, and thus my Perspectives; I wasn't saying that the Zip drive was the best tool for all our users, or the only game in town. But that it worked for me.

-Alan Zeichick

Errata

In Herb Tyson's article "Exploring Internet Relay Chat" in the August 1996 issue, Innovative Logic's IRC/2's current version should be 0.75 (not 0.65), the price is \$25, and the company's fax number is (301) 776-2120. Also, please note that this product is still in beta.



Bad News, Good News, and No News

BY TOR BERG

Merlin is imminent. While we thankfully have not witnessed a media circus, such as that surrounding the launch of certain other operating systems, OS/2 Warp 4.0 is nonetheless eagerly anticipated. As well it should be. Despite a rash of problems with the automated installation procedure, the beta version has been warmly received by the OS/2 community. Praises range from "Looks pretty good" to "Really slick." ISVs are pleased that the improvements seem incremental, without major changes to the underlying engine that would force a round of application upgrades. Felix Cruz of Sof-Touch Systems was happy to discover that the new version doesn't change the .ini files. He reports that Sof-Touch's developers are having no significant problems moving over to the new version.

Still, IBM is taking careful aim at its own foot. Apparently, the company is not planning a second beta release. If we'd seen a near-perfect beta, this move may have seemed appropriate. IBM has been at this computing thing for more than 40 years, and they do it pretty well. However, this decision is based on overconfidence. What of the installation problems that have been reported with the Merlin beta? Dedicated OS/2 Warp users probably will not be put off by installation bugs, but new users will be.

By the time you read this "Dateline: OS/2," Windows NT 4.0 will be shipping. Read: competition. OS/2 has Windows NT beat on support for legacy DOS systems, an important point for corporate IS managers weighing their options. And OS/2 Warp 4.0's

support for TrueType and other corporate standards is another selling point. But if these managers can't even get the thing installed, they might put in that call to Redmond, Wash.

Like money in the bank

We have some interesting numbers regarding OS/2 in the banking sector. Mentis Corp., a research firm specializing in the banking industry, projects that OS/2's overall client operating system marketshare will rise from 9% in 1994 to 25% by the end of this year. By comparison, Windows NT held 7% of this sector's marketshare in 1994 and should capture 9% by year's end. In regards to server operating systems,

OS/2 has maintained one-third of the marketshare in all large U.S. banks, compared to Windows NT's 13%.

The next time you're short on cash, step up to that ATM with confidence. IBM estimates that 80% of all newly installed ATMs—worldwide, mind you—run on OS/2 platforms.

Faretheewell

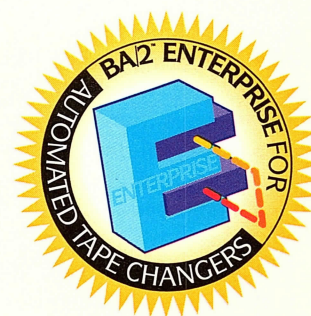
Brian Proffit's original "Test Drives" for this month included a review of WitchDesk 1.0, a desktop customization package. Just as we were going to press, we received word that WitchDesk Inc. has gone out of business. We always hate to see OS/2 companies fall by the wayside.

OS/2

OS/2 APPLICATIONS TOP 15 LIST—JULY 1996

This Month's Rank	Last Month's Rank	Product	Company
1	2	Hobbes CD-ROM Archive	Walnut Creek
2	3	Partition Magic 2 Personal Ed.	PowerQuest
3	10	FaxWorks Pro 2.0 Upgrade	Global Village
4	13	IBM AntiVirus 2.4 Desktop Ed.	IBM
5	4	BackMaster 2.0	MSR Development
6	11	UniMaint 4.0	SofTouch Systems
7	7	Object Desktop 1.5	Stardock Systems
8	6	System Commander 2.2	V Communications
9	5	BackAgain/2 4.0 Prof. Ed.	Computer Data Strat.
10	8	GammaTech Utilities	SofTouch Systems
11	15	KopyKat 1.2	Hilgraeve
12	-	Ctrl-Alt-Del Commander	Perez Computing Svcs.
13	-	QuickMotion 1.1	Practice Corp.
14	-	Performance Plus 3.0	Clear & Simple
15	-	Bitstream Font Collection	Bitstream

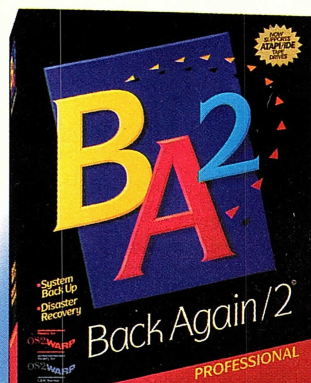
Since OS/2 Warp and OS/2 Warp Connect are consistently ranked as top-selling products, and sales of additional licenses can sometimes skew results, this list has been modified to highlight only the top-selling OS/2 applications. (Best-seller information courtesy of Indelible Blue.)



Maybe It's Time to Check Into a Good Recovery Program.

Needing intervention? A malfunctioning computer can cause dysfunctional behavior. Protect your work, your computer and your sanity with Back Again/2™, the ultimate backup and recovery for OS/2 Warp.

Now upgraded to version 4.0, you get all of BA/2's 32-bit power and broad device support, plus major enhancements. The integrated Workplace Shell Interface lets you back up and restore with "drag and drop" ease. Schedule any object such as a backup set, program, or REXX script to begin at a single date and time, a timed interval, or a combination of days at a chosen time. All by simply dragging it into the new Backup Scheduler folder! Configure any external command to execute before or after a backup is performed.



Estimate both backup time and size, plus many more configurable options.

And, BA/2 has enhanced its robust network support. It automatically finds network resources such as LAN Server and Netware File Servers. You can also back up LAN Server ACL (Access Control Lists) automatically.

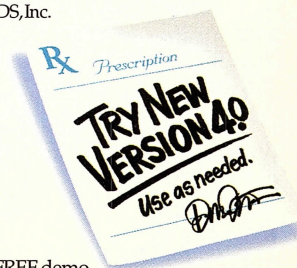
Now say this affirmation out loud, "Today I will buy BA/2 4.0, because I'm worth it." Preventive mental health begins with BA/2 4.0, the one-step recovery program.

Supports SCSI and ATAPI/IDE tape drives, networks, removable cartridges and floppy disks

System requirements: IBM OS/2.1 or greater

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Just Announced

Object Desktop Professional

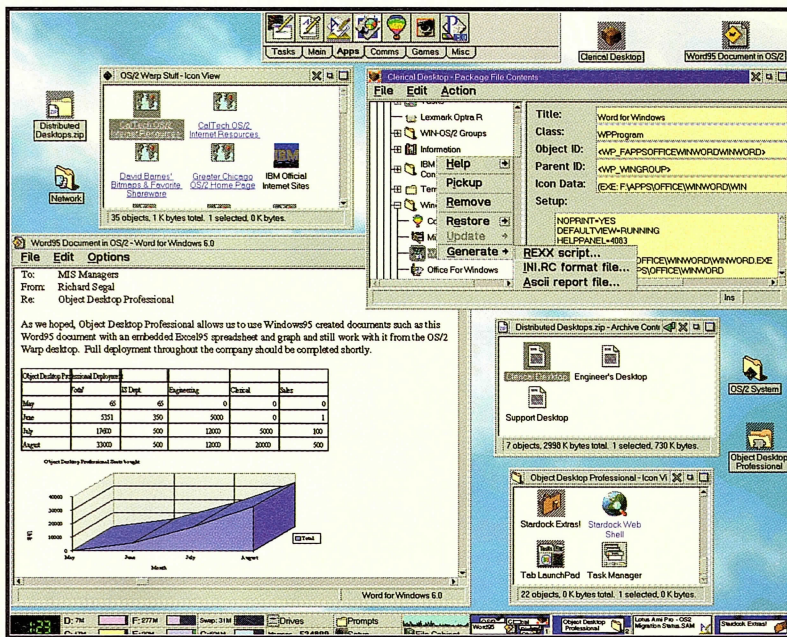
Corporate and professional business environment

Stardock Systems Inc. announces the release of Object Desktop Professional, its OS/2 WPS productivity enhancement tool. New in Object Desktop Professional are such features as: the Object Viewer, which provides the ability to read, print, and work with many file formats; Object Security, which allows end users and IS Managers to password-protect the desktop, program objects, and folders; Desktop Backup Advisor, which allows users to manage, back up, and restore desktop configuration "snapshots," as well as repair .ini files; Object Inspector, which gives users more control over object properties, in addition to browse and edit capabilities over the system registry of WPS classes; Object Advisor, which allows organizations to blend online help resources with desktop objects and link to intranets for help desk reporting and centralized data access; Object Backup, a system backup utility; and Object Scheduler, a special WPS folder that allows users to drag-and-drop programs or scripts and assign a time to execute.

Object Desktop Professional costs \$179, with special upgrade prices for Object Desktop 1.0 and 1.5 users.

Stardock Systems Inc., (313) 453-0328, fax (313) 453-1480, e-mail stardock95@aol.com, or see its Web site at <http://www.stardock.com/>.

READER SERVICE NO. 109



DB-Fill

Automatic test data

Byte of Software Systems Inc. presents DB-Fill. Define your database system to DB-Fill, and the program creates records for relational database systems, as well as single file database systems. The program creates floating numbers, integers, text, and date and time fields, and can also provide look-up lists and table lists. DB-Fill allows any number of counters and counter sets.

DB-Fill runs under OS/2, DOS 32-bit (including Windows 95), and Windows NT. The program retails for \$475.

Byte of Software Systems Inc., (604) 882-9200, fax (604) 882-9200, or e-mail info@bossi.com.

READER SERVICE NO. 110

Post Road Mailer Pro 2.0

Revamped e-mail package

InnoVal Systems Solutions Inc. has released version 2.0 of Post Road Mailer Pro, an OS/2 e-mail program for Internet and intranet e-mail.

Some of the new features in Post Road Mailer Pro 2.0 include: a new folder architecture making each folder a subdirectory; support for random

taglines; Preview Mail, allowing users to preview the mail in a POP3 server and selectively download or delete notes or files; sticky notes that can be attached to notes in your In basket or in a folder; support for MIME and UUencoded attachments; and a new search engine.

A full-function demo is available at <ftp://hobbes.nmsu.edu/incoming/post200.zip>, <http://www.aescon.com/bestofos2/demonstrations/post200.zip>, or <http://www.tiac.net/innoval/post200.zip>.

InnoVal Systems Solutions Inc., (914) 835-3838, e-mail innoval@ibm.net, or see its Web site at <http://www.innoval.com>.

READER SERVICE NO. 111

Text to Speech

Intelligible, synthetic speech

Dialogic Corp., a manufacturer of standards-based computer telephony components, has begun to ship the Lernout & Hauspie (L&H) text-to-speech (TTS) package on Antares under both OS/2 and DOS.

With L&H's TTS functionality built on Dialogic's Antares hardware open DSP platform, developers can create call-processing applications for commercial telephony systems. L&H's TTS solution converts any computer-readable text into intelligible, human-sounding, synthetic speech.

The new, higher-speed version of the Antares platform is capable of supporting 24 channels of L&H TTS, compared to 16 on the 2000/33. The L&H/Antares—OS/2 and DOS versions—are available now from Dialogic for \$250 per channel.

Dialogic Corp., (800) 775-4444 or see its Web site at <http://www.dialogic.com>.

READER SERVICE NO. 112

Extended Developer Kit for DB2

Use DB2 to manage multimedia objects

IBM delivers three new multimedia database extenders for its DB2 product. They support complex multimedia data types, including video, audio, and images, enabling customers to use their DB2 relational database to store, search, manipulate, and distribute multimedia objects ranging from voice annotation to photos to music and video.

Video, Audio, and Image DB2 Extenders are available in the Developers Connection Cross-Platform Developer Kit supporting DB2 for OS/2, DB2 for AIX, and DB2 for Windows NT. The Developer Kit is available at a subscription price of \$495.

IBM Corp., (800) 426-3333, e-mail askibm@info.ibm.com, or see its Web site at <http://www.software.ibm.com>.

CIC Productivity Pack

Financial and contact management

Computer Interface Corp. has combined Check+ and Contact Connection into the CIC Productivity Pack. Check+ is a personal finance manager for individuals and small businesses. Contact Connection is a contact manager for networked or stand-alone users. Both are fully CUA-compliant 32-bit applications developed for OS/2. The CIC Productivity Pack costs \$159 and is backed by a 30-day money-back guarantee, including 90 days of free technical support and upgrades.

Computer Interface Corp., (800) 992-3428, fax (508) 651-8112, e-mail info@ComputerInterface.com, or see its Web site at <http://www.ComputerInterface.com>.

READER SERVICE NO. 113

Lotus Notes and Web Connections

Access to VisualAge for Smalltalk applications

IBM has announced connection to Lotus Notes and the World Wide Web for its VisualAge for Smalltalk application development tool. Developers can now access Lotus Notes databases and create both Internet and intranet applications that are dynamic and interactive.

The VisualAge family of software application development tools allows developers to construct applications visually by connecting prefabricated, reusable software components from a library of predefined classes and parts from IBM and other vendors.

Both the Web Connection and Connection for Lotus Notes are available for OS/2 and Windows and are each priced at \$1,499.

IBM Corp., (800) 426-3333, (520) 574-4600, e-mail askibm@info.ibm.com, or see its Web site at <http://www.software.ibm.com>. **OS/2**

Just Announced OS/2 Internet Sites

OS/2 Warp Hotlinks

<http://www.engr.iupui.edu/~gdamlova/os2.html>

Pages full of OS/2 related links.

OS/2 Awareness

<http://www.northeast.net/~jweill/os2.html>

Show this page to your friends to help them understand why people like and use OS/2.

ColoradOS/2

<http://www.colos2.com/>

If you can't be there this month, visit the ColoradOS/2 Technical Conference homepage and find out what's happening.

Stern & Morrow Software Consulting

<http://www.icanect.net/~smorrow>

Specializing in OS/2 software development.

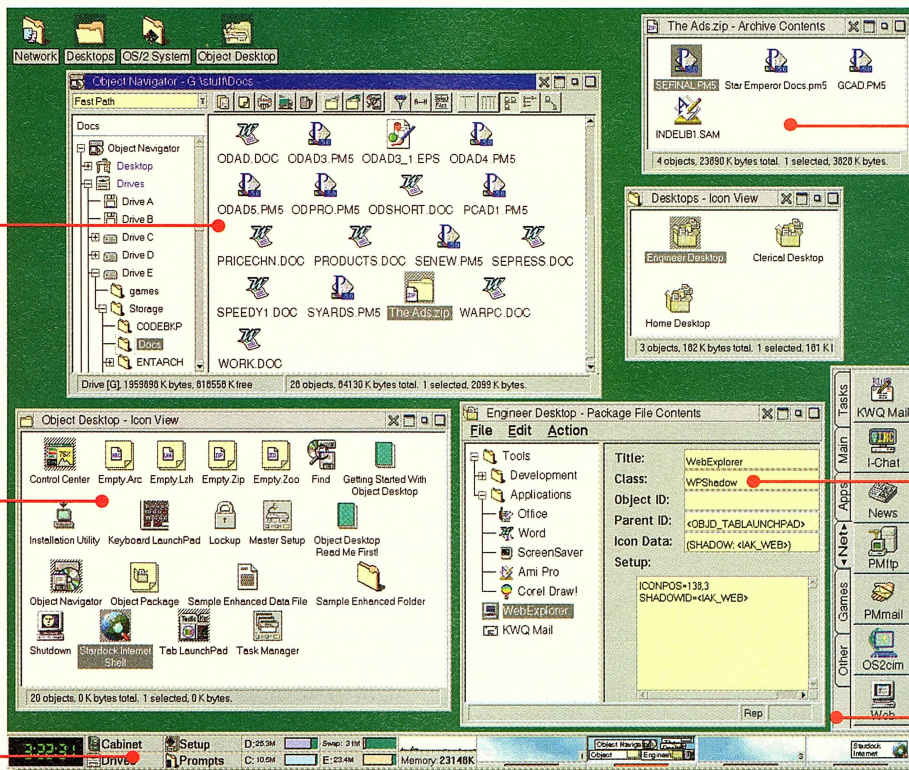
(Information provided by Vicci Conway, vicci@ibm.net)

Have You Upgraded Your OS/2 System Yet?

Object Navigator, the first object oriented file manager for OS/2, sees long file names on FAT partitions, shadows, program objects and uses OS/2's native association lists.

Object Desktop adds so many requested features to OS/2 that many new users consider it a third party upgrade to the operating system.

The **Control Center** monitors your resources, supplies virtual desktops, and even has cascading folders.



Object Archives allows you to work with your ZIP files as if they were standard OS/2 folders. View data and even run programs right from within the archive.

Object Package enables users to distribute their objects or entire desktops. It's truly the next generation way to manage your desktop.

The **Tab LaunchPad** allows you to manage your programs. It even keeps track of running programs in the "Tasks" tab.

"Object Desktop brings the OS/2 desktop up to its potential and, in doing so, brings it up to date. And it does it so well, I predict it will be an instant hit and best-seller for OS/2 for a long time. No one who sees it will want to do without it."

-InfoWorld.

"Object Desktop makes OS/2 look and feel like a new version."

-PC Magazine

"With the fine reputation Stardock has developed for OS/2 applications, I don't hesitate to recommend Object Desktop fully."

-OS/2 Magazine

"Object Desktop complements OS/2 so well that your immediate response is bound to be, 'That's the way a computer is supposed to work.' If you use OS/2, get Object Desktop. It's simply splendid."

-Computer Shopper

If you want to get the most out of your OS/2 system, you need Object Desktop. It's a powerful yet easy to use desktop environment that leverages the strengths of OS/2 to bring it to a whole new level of power, productivity, and performance.

By working with OS/2 users and IBM over the years, Stardock has created a product that provides the features and functionality that customers have been asking for.

If you or your company is looking for a product that provides the solution to the concerns of the vast majority of problems OS/2 users face every day, chances are, that solution is in Object Desktop.

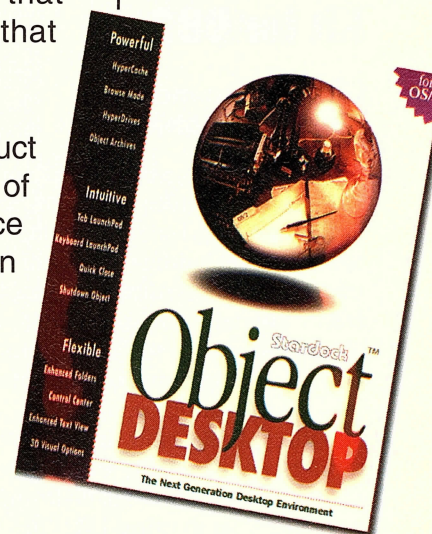
Upgrade your OS/2 system to a new level of power and ease of use. Upgrade to Object Desktop v1.5.

"Object Desktop's power, flexibility, and sheer presence will delight any OS/2 user!"

-PC User

"Object Desktop is the first thing I put onto all my PC's!"

-David Barnes



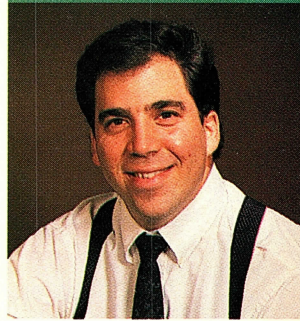
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Timed Execution, Removing Switch List, and More

BY DAVID REICH



TIP 251

TIMED EXECUTION

Q: I have seen some programs that run based on timed execution. Couldn't I do the same thing with REXX? Can you give me an example?

A: There are a few ways to run programs based on timed execution. You could choose to run a program at intervals, such as every 20 minutes, or you could choose to run your program at a specified time each day. Both methods use the same basic principle, the latter using an additional piece of code.

Both mechanisms will use the **SysSleep** function in the REXX utilities built into OS/2. As with other programs you have seen here and other places, you'll need to load the REXX utilities to use the functions contained within that library. Once the utilities are loaded, you can call **SysSleep** to cause your program to go to sleep for a specified amount of time, and then execute the desired program when it wakes up and

resumes execution. Listing 1 shows how to cause a program to execute every 20 minutes.

To add to this program, if you want to execute at, say, 5:00 a.m. each day, you could add to the inside of the **while** loop a check for the date and time using the intrinsic **DATE** and **TIME** functions in REXX. You will sleep, then when you wake up, make sure you are at the right time and/or date, and then execute. If you're not at the correct time, you could calculate how much longer till the time you want, and go back to sleep. This adjustment should not be necessary in general, but if, for example, you only want to execute every Monday, Wednesday, and Friday, when you wake up on a Thursday, you could go back to sleep. This method can be as simple or as complex as you desire.

TIP 252

TEMP FILE DISCARD

Q: In May 1996 ("Undelete Update,"

p. 20), you wrote about the **DELDIR** environment variable and how to make deletes permanent by turning **DELDIR** on and off. I have temporary files that get put in the **DELDIR** directory, but playing with the environment variables gets tiresome. Isn't there an easier way?

A: Yes, there is. Kenneth Porter on CompuServe sent in a procedure similar to the one I've been using. As you know, the **DELDIR** environment variable places deleted files in the directory specified by **DELDIR** for later deletion. An alternative to manipulating the environment variable is to create a separate partition just for temporary files and configure the offending applications (the ones that create unwanted temporary files like the spooler) to use it. Remove that partition's drive letter from the **DELDIR** environment variable.

You can then run a timed-execution program, such as the one in Tip 251, to periodically delete old files from this partition.

TIP 253

SYSLEVEL

Q: When I type

```
e:\os2\install\syslevel.os2
```

I see a **sys0191** message telling me that it cannot be run in an OS/2 session. What does this mean? How do I run **syslevel**? What other **syslevels** can be run?

Listing 1: REXX code for Tip 251

```
/* REXX code to have program to run every 20 minutes */
/* First load the REXX utilities */

call rxfuncadd sysloadfuncs, rexxutil, sysloadfuncs
call sysloadfuncs
do while 1 /* 1 evaluates to true so this gets done forever */
  SysSleep(1200) /* Sleeps for 1200 seconds = 20 minutes */
  'DIR' /* Or whatever program you want */
end /* End the REXX loop block */

exit
```


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Manage access to desktop resources such as objects, windows, and workspaces, with all activities subject to auditing.

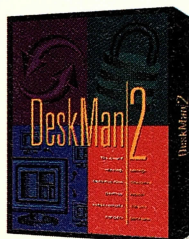
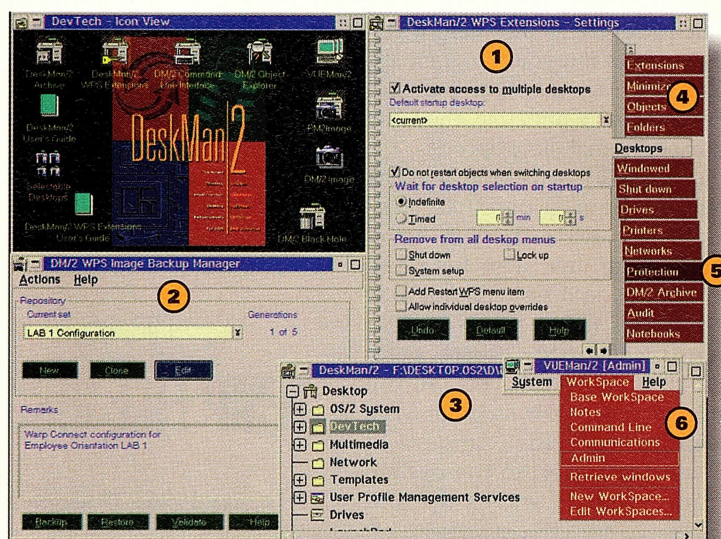
6 **Workspace Facility**

Define separate, named PM work areas, each with its own windows, task list, desktop, and context sensitive tools to organize your many daily activities. Check e-mail in one window, surf the Web in another, and still work on multiple projects in others!

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Reader Service No. 7

Enough Swapping

In Tip 224 ("Enough Swapping," April 1996, p. 17), I answered a question from a reader who was unable to change the **SWAPPATH** to point to an HPFS drive.

Specifically, the reader was trying to change the **SWAPPATH** from `e:\os2\system` to `d:\os2\system` where `d:` is an HPFS formatted drive. In my response, I overlooked the obvious, of which several readers promptly informed me. That other alternative is that the `\os2\system` directory on the `d:` drive must exist in order to create the swapper file *swapper.dat*. The system won't create the directory for you if this file doesn't exist.

A: *syslevel.os2* is a data file, not a program. The corresponding program's file name is *syslevel.exe*. *Syslevel* is a program you can run to determine the system or service level of various system components. Each component or service pack (FixPak) you install may create a *syslevel* entry, or it will update the component level (when you install service). The created or updated system level information is in the *syslevel.os2* file. *syslevel.exe* simply reads *syslevel.os2* and displays the data.

To view the system-level information, just open an OS/2 window or OS/2 full screen and type:

```
SYSLEVEL <enter>
```

You will see several screens of information corresponding to the fix level information for the installed components. This information can be used to determine what fix level you have or need. If you need service, you can then relay this information to the service representative.

TIP 254

REMOVING SWITCH LIST

I was once asked a question about removing the INETD process from the Window List to prevent users from terminating the process from the Window List.

The Window List is a visual representation of what is in an internal system structure called the Switch List. My answer directed the reader to write a small program to remove the

entry from the switch list. One reader, Uche Ogbuji, wrote such a program and offered it to me. The program is shown in Listing 2, and assuming you call it *rmwinlist*, you can type

```
rmwinlist <title_string>
```

where `<title_string>` is the exact, case-sensitive Window List title to be removed.

TIP 255

WHERE'D IT GO?

Q: In May 1996 ("Undelete Update," p. 20), you wrote about some settings for enhanced functionality within Presentation Manager and window management. For example, you showed how to use the `PM_DYNAM-IC_DRAG` setting. I have the new OS/2 Warp 4 (a.k.a. Merlin), and in

Listing 2: Removing an item from the Window List.

```
//rmwinlist.c
#define INCL_WIN
#include <os2.h>

#define MAX_BYTES 4096
BYTE raw_block[MAX_BYTES];

int main(int argc, char * argv[])
{
    HAB hab;
    PSWBLOCK switch_block = (PSWBLOCK)&raw_block;
    PSWENTRY curr_switch_entry = (PSWENTRY)(raw_block +
        sizeof(ULONG));
    HSWITCH hswitch = 0L;
    int index;
    char *arg_string;

    if (argc == 2)
    {
        arg_string = argv[1];
        hab = WinInitialize(0);

        WinQuerySwitchList(hab, switch_block, MAX_BYTES);

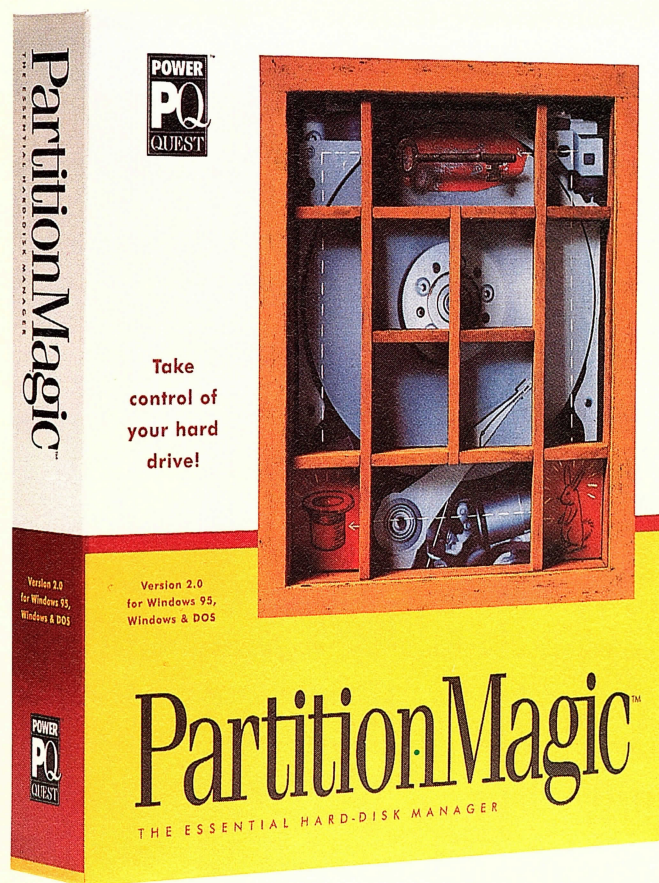
        for (index = 0;
            index < switch_block->cswntry;
            index++, curr_switch_entry++)
        {
            if (strcmp(arg_string, curr_switch_entry->swctl.szSwtitle) == 0)
            {
                hswitch = curr_switch_entry->hswitch;
                break;
            }
        }

        if (hswitch != 0L)
        {
            WinRemoveSwitchEntry(hswitch);
        }
    }
    return 0;
}
```


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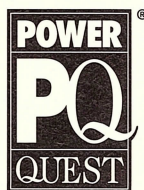
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space by resizing the partitions on your disk quickly, easily and without destroying data. PartitionMagic is the only utility that also lets you partition your disk so that you can safely run multiple operating systems, as well as organize your data for efficiency. Industry publications call it the utility no computer user should be without. Best of

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Boot Logo

In Tip 207 ("New Logos," January 1996, p. 20), I showed how to make a new boot logo (by using *plogo100.zip*) that you can have displayed when your system boots up. Ian Finlay and Leonard Bosh both sent in information on other programs you can use to create boot logos as well. One program is on America Online, and the other can be found on CompuServe.

On CompuServe, you can find the program BMP2LOGO in the OS2DF2 forum library. This program allows you to create a logo file from a bitmap providing that the .bmp has no more than 16 colors. After you run this program, you will run **MAKELOGO** to create the boot logo file.

On America Online, there's another program that allows you to create a boot logo file, which comes with a few substitute files for you to try. Search for **BOOTLOGO** to find it and all the instructions for how to use it.

my system settings notebook, I see a page with similar settings. What is the difference and how do I use these settings?

A: When that issue was written, the only way to get to functions such as PM_DYNAMIC_DRAG and the system input queue sensitivity setting (in the issue before) was through the *config.sys* settings. In the OS/2 Warp 4 project,

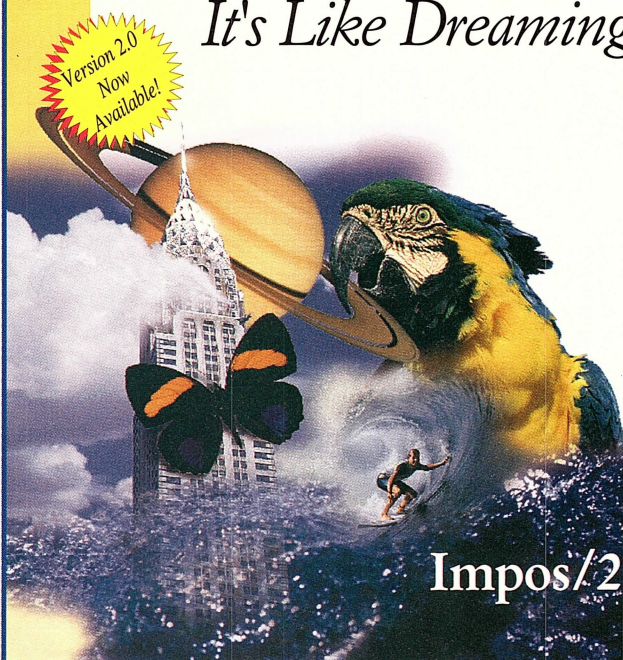
these functions and settings have been moved to the system settings notebook. The functions are essentially the same as before (some minor enhancements have been made), but the configuration of the features is made easier with this notebook.

One function that has been requested often and is now available in OS/2 is the ability to tell the system not to display the Are you sure? dia-

log box when closing a windowed command prompt from the system menu. As you will recall, typing EXIT will remove the command prompt window, but if you do it from the window controls, you get a dialog box asking you if you are sure you want to exit. Now you can tell the system to not display the dialog. **OS/2**

David Reich has been with the OS/2 development team since 1987. David is a contributing editor and has written numerous articles on OS/2 and is the author of Designing High-Performance OS/2 Warp Applications, published by John Wiley & Sons. Questions can be addressed to David via CompuServe at 76711,632 and via the Internet at speedracer@austin.ibm.com.

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Outfitters For The Information Frontier

MERLIN MEANS MAGIC

The latest version of OS/2 Warp looks like a real winner. By Brian Proffitt



By nearly any measure, IBM's OS/2 Warp 3.0 (in its various flavors) was a success—today, the total number of OS/2 licenses is over the 12 million mark. But that wasn't enough for IBM. So, on June 16, IBM unveiled the beta release of OS/2 Warp 4.0, code-named Merlin. This release is definitely a major upgrade to plain old OS/2 Warp, with plenty of new functions added and some welcome changes to the user interface. On the other hand, the underlying engine didn't change enough to generate the stability concerns that normally accompany an x.0 release of an operating system.

The color game

When OS/2 Warp 3.0 first came out a year and a half ago, most computers were still shipping with 4MB RAM standard. At that time, IBM made a big deal over OS/2's entry into the home market, pointing out that OS/2 Warp could still run (although glacially) on a 4MB computer. As the first variations gave way to the blue-boxed OS/2 Warp FullPak (with Windows application support built in), and then OS/2 Warp Connect (with network client and peer capabilities), the memory requirements and target audience changed.

OS/2 Warp Connect really accelerated the acceptance of OS/2 and set the new minimum standard. As a result, OS/2 Warp 4.0 will come in only one flavor, with all of the functionality included. No more confusion over red spine (includes Win-OS/2) vs. blue spine (enhances your existing Windows) vs. blue spine (Connect). There will be both regular and upgrade versions, but both will include the full range of features previously associated with OS/2 Warp Connect (and more). As a result, the minimum configuration for OS/2 Warp 4.0 is a 33MHz 486-based system, with 12MB RAM and 100MB of disk space available for the operating system—modest by today's standards for new computers and most sold in the past year.

Realistically, you should have at least 16MB of memory, and it can take 200MB or more of disk space, depending on the options you select. In testing the beta, my installation took 250MB, including the swap file. I installed all the bells and whistles, however, along with some developer's tools that many users might not want. It's hard to gauge these things from beta code, but I'd say a minimal implementation would take around 100MB.

IBM's primary target for OS/2 Warp 4.0 is the enterprise client system; the secondary target being business commuters who want the same system at home and on the road as at the office. However, there is still much here of value to the small office/home office user, in addition to the leading-edge power users that have always been a strong part of OS/2's audience.

Let's take a close look at the OS/2 Warp 4.0 beta. Before we begin, one caveat: Because we're looking at a prerelease version, some of the features described may change (for better or worse) by the final release. When is the final release due? IBM's still being cagey about dates and prices, but you should expect to see a final OS/2 Warp 4.0 before the end of 1996.

Up and running

OS/2 Warp 4.0's installation process is somewhat smoother than its previous versions. It's made easier with OS/2 Warp's new support for ISA Plug 'n Play cards, added to the existing support for Plug 'n Play PC Cards (formerly known as PCMCIA cards). Installation also includes new or enhanced options for support of optical drives, IrDA-compliant infrared ports, and docking stations. In a major move toward broader hardware support, IBM included a second CD-ROM with many device drivers not previously found in the base product. The Device Driver CD is done in HTML format and has many drivers on the disk, plus links to Web sites where you can download the latest drivers from other product vendors (Figure 1).

Enhanced hardware "snoopers" are used to automate installation; their goal is to figure out which accessories and peripherals you have attached. My results were mixed: The snooper detected all of my hardware except the HP LaserJet printer and Archive Python SCSI tape drive. Unfortunately, in some cases the snoopers can lock up during detection. There's a way around the problem, but it requires some manual steps that are nowhere near as intuitive as Windows 95's installation dialog, which asks if you want hardware detected automatically or to bypass that step to avoid lockups.

So many new functions exist in version 4.0 that IBM isn't going to bother with a floppy-disk version. The company would have to add a hefty surcharge for the 100 or so disks it would take! CD-ROM drives aren't necessarily required, however, because you can install OS/2 Warp 4.0 remotely across a LAN. With a CD-ROM drive, installation should take almost an hour and a half, depending on the options selected. The progress indicators are fairly useless during this period, since they reach 100% and then reset to 0% at least half a dozen times for no apparent reason.

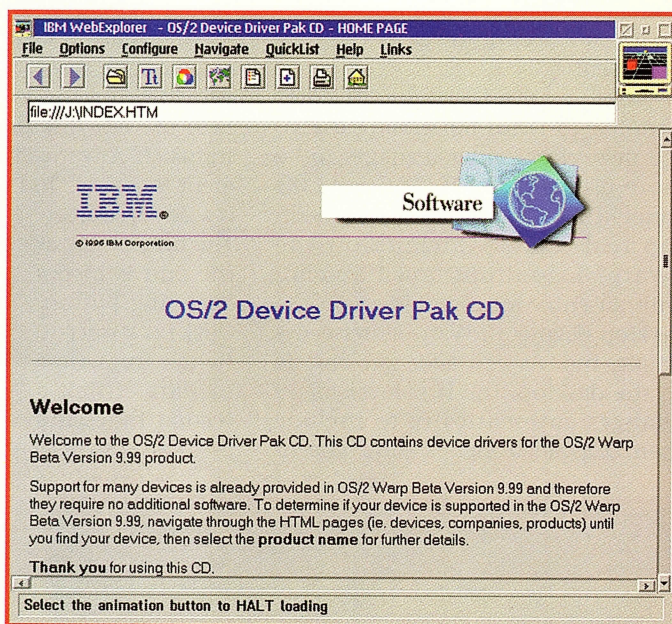
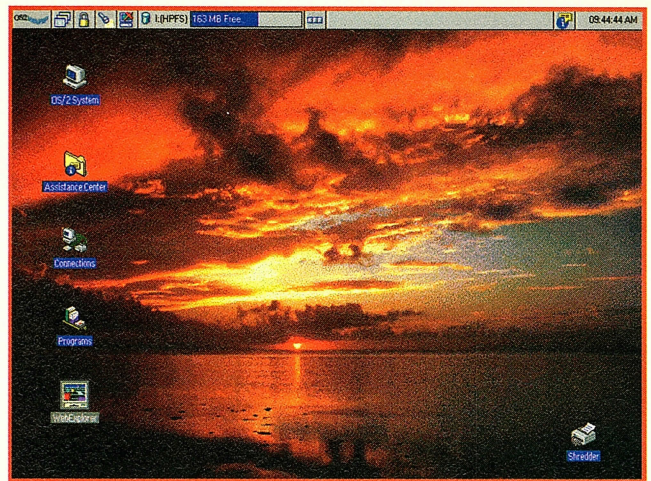
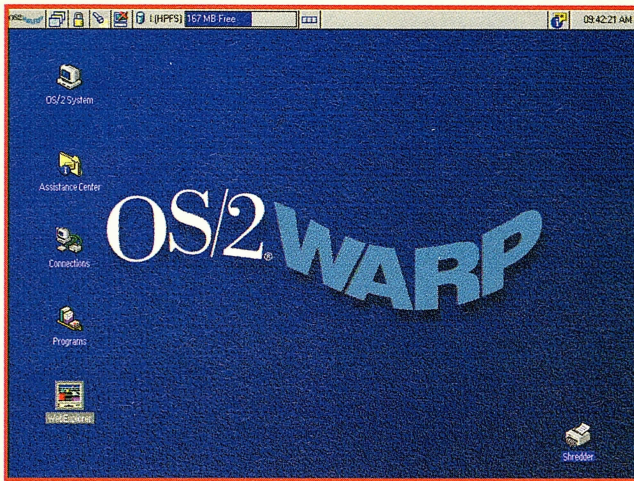


Figure 1: The HTML-based Device Driver CD-ROM has many additional drivers and URL links.



Figures 2a and b: The default desktop is much more attractive, and additional bitmaps are included.

Point and click

You will immediately notice improvements in OS/2 Warp's user interface. For example, you aren't immediately greeted with a plain, boring 16-color desktop (Figures 2a and b). The assumption now is that your video subsystem will support at least 256 colors. A snazzy, textured OS/2 Warp logo wallpaper is used by default, and a number of other nice bitmaps are included. OS/2 Warp will still run with 16 colors, if you have an older system, but the interface isn't dragged down to that level by default. Also, the icons have been improved, with a more three-dimensional appearance. The biggest difference you'll see, however, is the new WarpCenter.

Based on the Lotus SmartCenter (familiar to Lotus SmartSuite users), the new WarpCenter manages to be more useful than OS/2 Warp 3.0's LaunchPad, while requiring less desktop real estate. Clicking on the "Warp" logo drops down a menu with an entry for each object on the desktop (Figure 3). WarpCenter is dynamic, too. As you add new objects to the desktop, the first-level menu changes automatically to include them. Cascaded menus allow you to

access the contents of these containers without having to open their windows. You aren't restricted to objects in predefined folders, because (using the Drives entry in the OS/2 System menu) you can drill down through subdirectories to access any file on any drive through the WarpCenter (Figure 4).

The WarpCenter includes buttons that offer single-click access to a list of running programs (but in menu form rather than the textual Window List you see when pressing <Ctrl+Esc>), the Seek and Scan program for finding files, desktop lockup for security, the Information Center with online help, and system shutdown. Another button changes its contents as you click on it, rotating through and showing the available space on each of your disk drives, the battery status (if Advanced Power Management is active), and the system activity level meter.

The time of day is also a changing button. Click on it once to switch from time to date. Click a second time, and the button switch-

es to a timer. This isn't high precision, but it does let you monitor how many of those precious free minutes you've spent on the Internet.

There is a large tray area on the WarpCenter, which starts out empty. Here, you can drop your most frequently used programs for single-click access (Figure 5). But you aren't restricted to the size of the area. You can create several of these tray areas and switch between them quickly. Taking the best from several ideas, WarpCenter manages to be more useful than the LaunchPad, Lotus' SmartCenter, and Windows' Task Bar. I just wish IBM had adopted the idea of automatically opening cascaded menus as soon as you moved the pointer over their upper-level counterparts. If I move the pointer over "OS/2 System," why should I have to click on it to see the container's contents?

Another improvement is the

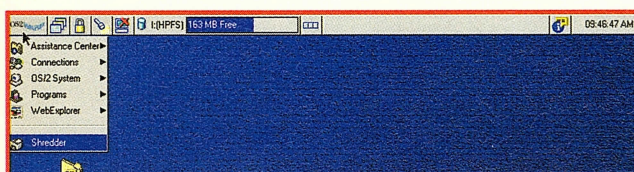


Figure 3: The WarpCenter provides program access through drop-down menus.

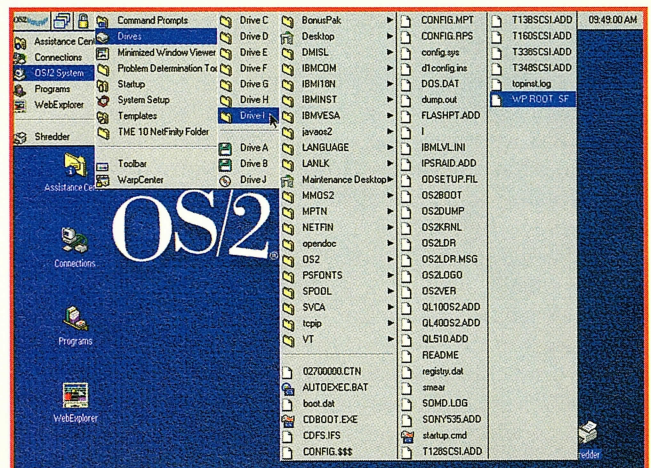


Figure 4: Access any file in your system without opening a window.

WarpGuide, which you can think of as a set of wizards that guide you through selected desktop operations. WarpGuide lets you define your familiarity with OS/2 Warp on a scale from 1 (not familiar with computers) to 3 (familiar with computers and OS/2) and presents help panels appropriate to your level (Figure 6). An artificial-intelligence engine within WarpGuide modifies itself as you become more experienced.

WarpGuide was only designed to work on a handful of desktop operations, such as changing your screen's resolution, but IBM opened its use up to developers. New APIs in OS/2 Warp 4.0 allow programmers to create WarpGuide wizards for their own applications. Developers can also take advantage of an improved notebook control with a better appearance and usability. A nonintuitive option of right-clicking in the frame area pops up a menu with all pages in the notebook listed. If there are three pages within one tab, they can all be reached through the menu.

Speech! Speech!

OS/2 Warp 4.0 raises the standard of PCs by being the first desktop operating system with built-in speech support. This new version of IBM's VoiceType software does not require (nor exploit) the VoiceType hardware adapter that came with earlier versions of the speech product. Rather, it works with any sound card supported by OS/2's multimedia engine, MPM/2, such as the MWAVE circuitry inside newer ThinkPad notebooks or SoundBlaster-compatible boards.

With no training to a particular voice, VoiceType approached perfect recognition on simple desktop commands such as "up," "down," "open," and "close." I was easily able to do more complex desktop functions, too, with commands like "move bottom border down 10," which expanded a window down 10 pixels. VoiceType goes even further though, by being embedded into OS/2 Warp deeply enough to allow the opening of programs and files that aren't even visible. No matter what is on the screen, saying, "Jump to OS/2 System Editor" causes the editor to load and its window to be displayed. The menu items in the active window are automatical-



Figure 5: Add frequently used programs to WarpCenter trays.

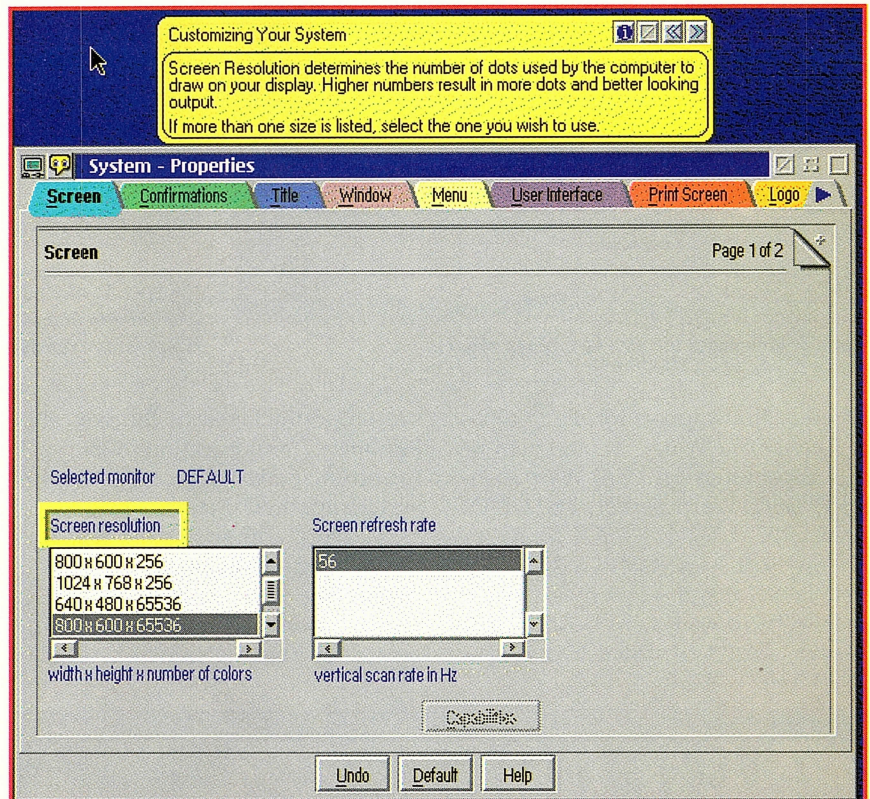


Figure 6: WarpGuides provide automatic assistance on selected tasks.

ly scanned and enabled for speech. In fact, I was able to select menu items in Win-OS/2 sessions through speech. This works for controls in dialog boxes, too, where I was able to select check boxes and drop-down list boxes all through voice control.

If the cursor is in a field that accepts text from the clipboard, you can say, "Begin dictation" to exit navigation mode and pop up a dictation window. Dictate your text and say, "Send," and the text is automatically pasted into your program. Dictation recognition came in around 90% without training to a particular voice, and then went up to around 93% when I switched to an active noise-reducing microphone. IBM is considering bundling active noise-reducing microphones from Andrea with Warp 4.0. After training VoiceType to my voice, the accuracy level jumped to around 96%. Over a couple of weeks, as you correct VoiceType's recognition errors and it learns from those

corrections, the accuracy level should creep higher. Navigation can be done in continuous speech (the way we normally talk), but dictation requires a slight break between each word for recognition. I strongly suggest users take the time to train VoiceType, if for no other reason than getting used to speaking in distinct words.

This level of speech recognition takes a fair amount of system resources, and the minimum system level goes up to support it. If you're going to use speech, IBM recommends a minimum of a Pentium-level processor, and I suggest at least a 90MHz Pentium CPU. You should also have at least 24MB of memory for acceptable performance. I found speech recognition to be unacceptably slow on a 16MB system, but worked great when I bumped the system to 40MB.

Making connections

Because the enterprise client system is IBM's target, you shouldn't be sur-

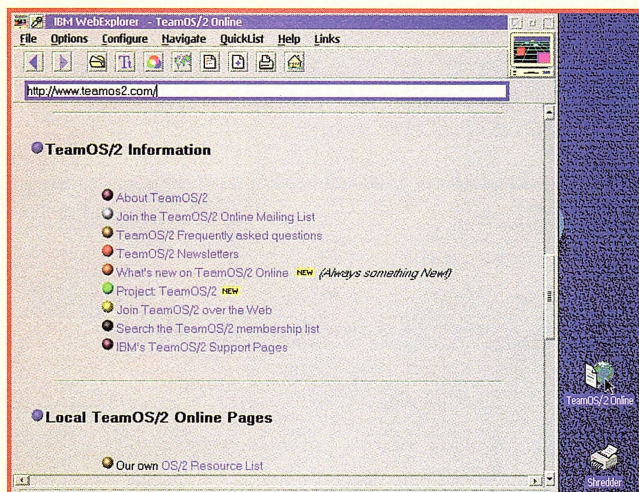


Figure 7: Web pages can now be desktop objects.

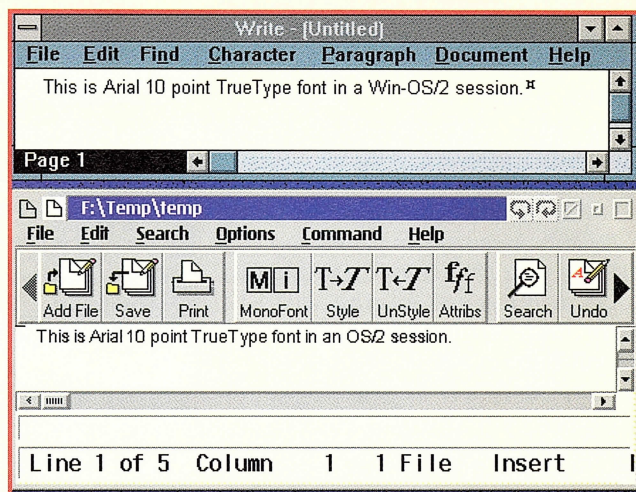


Figure 8: You can now use TrueType fonts in OS/2 sessions.

prised to find support for many types of LANs. OS/2 Warp 4.0 has client or peer capabilities for OS/2 Warp Connect, OS/2 Warp Server, OS/2 LAN Server, PC LAN 1.3, LAN Manager 2.x, Artisoft's LANtastic 6.0, Novell NetWare 3.x and 4.x, Vines, Microsoft Windows 95, Windows NT Server, and Windows NT Work-

station, all included in the box. IBM Personal Communications 5250/3270 is also included for access to AS/400 and mainframe systems.

Network administrators will find several useful tools in OS/2 Warp 4.0, including the Security Enabling Services, designed to detect and support your existing network security

schemes, and TME/10 NetFinity, a network monitoring and alerting tool. A custom version of International Software Solutions' Remote Services Management is also included for more severe problems, allowing IBM representatives to access your system directly for a detailed diagnosis.

You can access your network remotely, too, through dial-up or ISDN connections. Mobile File Synchronization allows you to work on network files even when you aren't connected, with your local version and the network version synchronized automatically when you do connect.

Rushing to the Internet

IBM's home-grown browser, WebExplorer 1.2, is included in OS/2 Warp 4.0, and it has some nice enhancements. In the first beta, it did not support Java, although this is supposed to be in place before the final version. What WebExplorer does have is speech support. As a Web page is downloaded, all hot-links are detected. If you say "Links," a menu pops up with all links visible on the current page listed. Saying the text associated with a link takes you surfing across the Net by voice command alone. I found this sketchy in the beta, with the links on some Web pages showing up fine and on other pages not showing up at all. The trend to embed links within graphic images will be a continuing challenge for IBM.

WebExplorer also has a link to the Workplace Shell. If you are looking at a page that you think you might refer to frequently, drag the page onto the

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desktop. A new desktop object is created with the page's URL (uniform resource locator) attached. When you open that object, the browser is automatically launched and directed toward that page (Figure 7). And, like any other desktop object, you can attach a voice command to simply say, "Jump to TeamOS/2" and have the browser load the desired page. This desktop functionality also works with FTP sites. You can create an FTP object on your desktop and drag and drop files onto it just as if you were working with any other disk drive.

However, short of manually modifying the properties notebook of each URL object, there is no way of telling OS/2 Warp that you are accessing the Internet via modem rather than the LAN. If you're a modem user and don't have your TCP/IP link established, opening one of these objects will start WebExplorer, which will promptly tell you that it can't find the page you're looking for. Also, unlike Windows 95 and Windows NT, closing a dial-up Internet session won't bring up a window asking if you want to terminate the connection. You have to do that manually. Remember, the target audience is the enterprise client, so IBM makes a number of assumptions about its users.

By the way, you don't have to be running the WebExplorer browser to run Java apps. They can be run directly from the OS/2 desktop just like DOS, Windows, and OS/2 programs. A Java Developer's Kit, complete with class libraries, is included with OS/2 Warp 4.0, so you can develop your own Java applications.

From Windows to OS/2

OS/2 Warp 4.0 has some new things designed to encourage people to move from Brand M to Brand I. For example, OS/2 Warp now supports TrueType fonts, so those who depend on them in their applications or documents can move them to OS/2. The Arial, Times New Roman, and Wingding fonts found in Windows are installed automatically, and additional TrueType fonts can be added as easily as we previously installed Adobe Type Manager fonts. The rendering of TrueType fonts isn't as clear on the screen as under Windows, though. I suspect that Windows has

some bitmapped versions of the fonts, while OS/2 Warp only uses outline versions (Figure 8).

Support for the Win32s API has been enhanced also, with support upgraded to Win32s version 1.25a. As a result, more 32-bit Windows applications are compatible with OS/2 Warp, although you still can't run applications that require Windows 95 or Windows NT. Developers can now choose the Open32 API (formerly known as the Developer API Extensions), which allows writing to a single interface for programs that run on both Windows and OS/2.

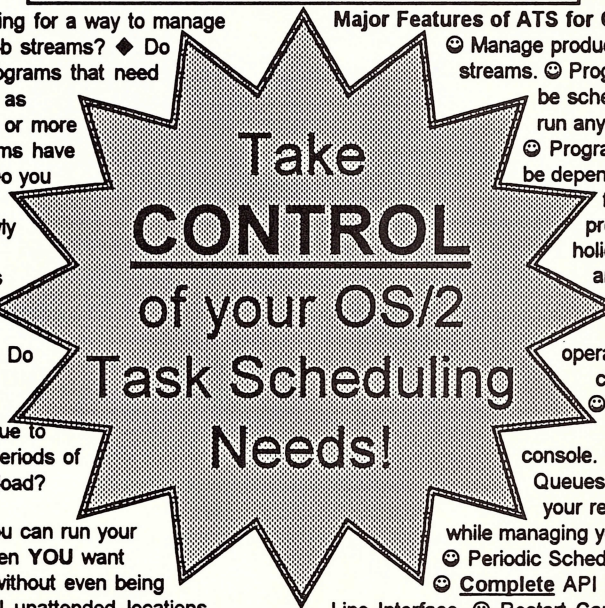
Also inside OS/2 Warp 4.0 are OpenDoc run-time modules, as well as a subset of the OpenDoc developer's kit. Graphics program developers can now use the OpenGL APIs for more powerful 3D graphics, and developers of video device drivers have Graphics Adapter Device Driver (GRADD) APIs to simplify supporting their video adapters. And new Speech Recognition APIs allow developers to embed speech support in their applications.

Now that VoiceType is included with OS/2 Warp, developers can take the time to exploit it, confident that their customers will have the base code.

Two thumbs up!

OS/2 Warp 4.0 breaks new ground in usability, particularly with its speech support. It also makes life simpler for developers, allowing the use of a number of programming interfaces. The network connectivity options are excellent, and the linkage with the Internet is unprecedented. OS/2 zealots will no doubt complain about IBM's marketing campaign (or lack of one) for this new version, but keep this in mind: IBM has clearly defined OS/2 Warp 4.0 as primarily an enterprise client system. Its marketing plans won't have the masses in mind. **OS/2**

Brian Proffit is president of Visionary Research, senior contributing editor for OS/2 Magazine, and solutions advisor to PC Magazine. He can be reached at 75300.1466@compuserve.com.



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All the News That Fits

If you're an Internet news hound, here are more choices
for newsreading software. By Herb Tyson

The Internet is many things to many people. To most fledgling Internet users, the primary attractions are e-mail and the World Wide Web. To many veteran Internet users, however, the driving force is something called Usenet newsgroups. Newsgroups consist of some 20,000 subject categories of messages and are similar in concept to message or conference areas on electronic bulletin boards. Tens of thousands of Internet users read messages posted by other users daily. If they have something to contribute, they respond to an article or post a new one.

To access newsgroups, you'll need two things: a connection to the Internet and software that's able to read newsgroups. This software, called a "newsreader," is similar in concept to e-mail packages, FTP clients, or Web browsers (in fact, some browsers, such as WebExplorer or Netscape's Navigator 2.x include newsreader functionality). OS/2 Warp includes a newsreader, called NewsReader/2.

When you hook up to the Internet and fire up a newsreader for the first time, you'll usually download a complete list of newsgroups from your news server (a computer where newsgroups reside to which you connect over the Internet). Once you have that list, you subscribe to the newsgroups that interest you (such as *comp.os.os2.announce* for OS/2-related news). Subscribing usually involves nothing more than highlighting the names of certain groups to tell your newsreader which groups to read. Next, you instruct your newsreader to fetch a list of article headers (usually containing subject title, message number, date, and author's name). Finally, you peruse the list of headings and read those messages that seem interesting or useful.

The terminology—news, articles, subscriptions—is a bit sticky but has over a decade of momentum behind it (or maybe it's inertia), rooted in newsgroups' academic beginnings. The term "news," while not terribly accurate, is sometimes appropriate. For example, many news servers carry a set of over 350 newsgroups that begin with *clari* (such as *clari.world.top*). These newsgroups, in fact, do carry news—actual news articles written by actual reporters. Ordinary Internet users cannot post to such groups.

Many newsgroups also have the word *announce* in them. Such newsgroups are read-only to ordinary users. If you have an announcement, you e-mail it to the moderator of the newsgroup. The moderator weighs the relevancy of the article and posts it (assuming it's relevant). Except for announcement newsgroups and news newsgroups, Usenet is, for the most part, the world's largest open discussion forum.

More than that, however, newsgroups are a bountiful source of information, especially for OS/2 users. More than 80 newsgroups pertain to OS/2, the most active of which begin with *comp.os.os2*. For example, *comp.os.os2.networking.tcpip* and *comp.os.os2.apps* are great places to go if you have questions about using OS/2.

Like much of the archaic Internet, newsgroup articles are text-only, due to the fact that many of the older UNIX software systems lacked the ability to transfer 8-bit data. Some years ago, someone decided that it might be nice to be able to post binary files, such as executable programs, formatted word-processing files, and graphics files, to newsgroups. The trick, of course, was to translate 8-bit data into Internet-friendly 7-bit text (expanding it somewhat in the process). The common newsgroup standard is called uuencoding; known as "binaries" (one of computing's greatest misnomers). These uuencoded files often show up in newsgroups that have the word *binaries* in the name.

Now that we've talked about the basics of newsgroups, let's look at the newsreader you probably already have, NewsReader/2, and some of the higher-powered alternatives.

NewReader/2

As we said earlier, to get at all this news, you need newsreader software. For most OS/2 Warp users, the logical first stop is NewsReader/2, which is included in OS/2 Warp's Internet Access Kit (you'll find it on the BonusPak CD-ROM). Whether or not NewsReader/2 suits your needs depends upon how often and in what manner you use Usenet, as well as how your news server works. If you use a standard news server and have modest news needs, then NewsReader/2 will probably serve your needs quite adequately. If your news server requires a login name and password, or if you like to read news offline (that is, while your machine is not directly connected to the Internet), then NewsReader/2 won't fit the bill.

To its credit, NewsReader/2 has an operational simplicity that makes it very usable, especially if you're fond of using the keyboard rather than the mouse. The <Tab> key moves you among any open NewsReader/2 windows. At the article level, you can move from article to article by pressing a single <N> or <P>.

NewsReader/2 also has the ability to save articles to disk. You can append articles to an existing file, making it easy to accumulate information regarding a specific topic. You can save articles by pressing the <F2> key or by dragging the article icon (from the upper left corner of the article window) to a folder or program object. However,

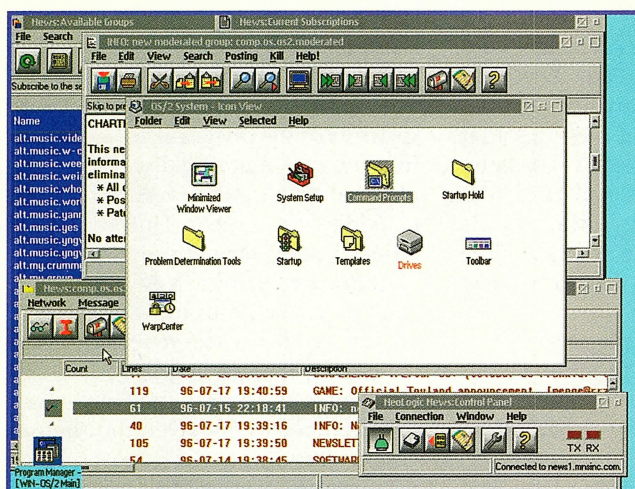


Figure 1: Neologic News.

NewsReader/2 has no way to organize articles you save; saved articles must be perused using something other than NewsReader/2, and the ability to compose responses is available only when you're online.

The ability to work offline is also foreign to NewsReader/2. Offline newsreaders can download all news messages in your subscribed newsgroups in one fell swoop, often automatically. You can then disconnect from the Internet (a real boon when you're working from a pay-as-you-go dialup connection) and read, print, or reply to newsgroup messages at your convenience. Next time you connect to the Internet and launch the newsreader, it'll send your outgoing responses and read new messages. But you can't do that using NewsReader/2.

NewsReader/2 has other limitations, as well. A growing number of private and special-purpose news servers require login names and passwords. NewsReader/2 makes no provision for accessing such servers.

While it doesn't accommodate password-restricted servers, NewsReader/2 *does* let you address multiple servers. However, changing news servers is rather tedious. You'll usually need to create separate program objects to handle the different servers efficiently. This method can mean a fair amount of stopping and restarting to access different news servers.

Another feature often needed by newsgroup users is the ability to process uuencoded binaries. NewsReader/2's ability to drag articles to a destination object or folder affords a way to semiautomate the process. However, you must first obtain a uudecoder program (which turns the 7-bit Internet files back into OS/2-compatible 8-bit files) and set up a program reference object for it. Then you can drag an open article's icon to the uudecoder for decoding. If the binary consists of multiple articles, however, you'll have to manually assemble them into the same article window before dragging. While the process is fairly easy for single-file binaries, it's cumbersome for multifile operations.

Neologic News 4.5

Neologic News is a multiwindowed newsreader that offers a number of improvements over NewsReader/2 (Figure 1).

First and foremost, Neologic's newsreader includes offline capabilities. You can instruct the newsreader to download—for offline perusal—individual messages, threads, whole newsgroups, or all newsgroups at the same time. Second, Neologic lets you specify a number of different news servers in the configuration settings, as well as a user name and password for restricted news servers.

Before getting too excited about the offline capabilities, I should point out an annoying limitation. You cannot search through multiple articles for text while offline, even though the articles are present on your disk. Searching through available articles locally would be much faster than culling through articles located on a remote server. Alas, such searches can be performed only while online. However, according to Neologic, this limitation should be lifted with the next release.

Another limitation pertains to how Neologic News addresses different news servers. While Neologic does provide for different news server names, it does not carry the logic far enough. Server information and user information are maintained separately, and therefore, user names and passwords can't be specified separately for each distinct news server. If one server requires a login name and password, and another doesn't, you can't set Neologic to behave accordingly. Thus, you must modify the configuration settings each time you switch between a passworded and nonpassworded news server, making switching rather clumsy.

One feature that is well-implemented is uudecoding of binaries. Neologic News comes with its own uudecoder and automatically handles decoding of multi-article binaries. Armed with this feature, it's extremely easy to download and convert all the quality artwork you'll find on the art-oriented newsgroups.

Yarn and Soup

Knitting and lunch? Nope. Chin Huang's Yarn (Yet Another News Reader) and Soup (Simple Offline Usenet Packet) are a combination of text-mode utilities that can be used to automate and manage newsgroups. Unlike NewsReader/2 and Neologic News, Yarn and Soup are not graphical Presentation Manager (PM) applications. What they lack in bells and whistles, however, they make up for in utility. Once connected to the Internet, Soup can quickly download messages from your chosen newsgroups. Then

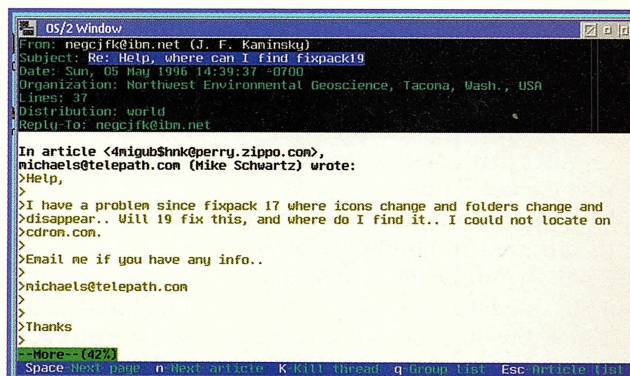


Figure 2: Yarn, a text-only message reader.

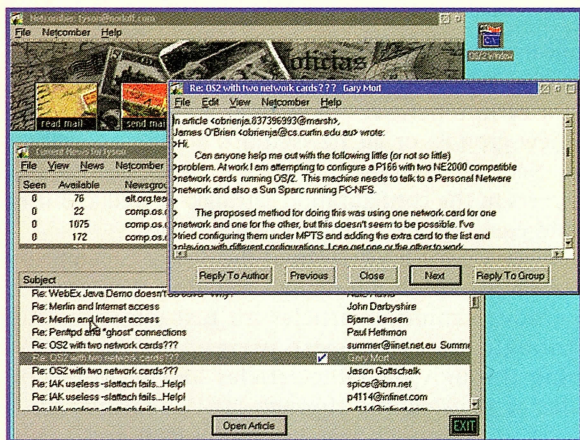


Figure 3: IBM's Netcomber suite.

you can use Yarn to read and respond. Soup and Yarn can also read and respond to e-mail.

Unlike PM applications, Soup and Yarn require a fair amount of manual installation and preparation. To use them, you'll need to download two separate packages and then perform a bit of setup. If you're a heavy-duty newsgroup user, however, these packages might be worth the effort. Using a single command-line command, which you can easily consign to a program reference object, Soup connects with your news server and gathers all the new messages in any newsgroups in your subscription list. (You must assemble this list manually using a text editor.)

While a bit messy to set up, Soup gives you options you don't have with other news solutions. For example, you can instruct Soup not to download messages exceeding a certain length. If you don't want Soup to waste time downloading lengthy binaries, you can tell Soup to exclude messages with, say, more than 100 lines. Soup offers a number of additional and useful options that let you filter out messages that don't interest you.

Once Soup finishes downloading messages, you can use another utility to convert the Soup packets into a news data file that can be read by Yarn. After that's done, you use Yarn to read the news. Contrasted with the PM applications, that's a lot of steps with different programs. However, the payoff might be worth it, depending on your needs.

Unlike the other newsreaders, Yarn is geared to users who want to maintain an archival news base. Among

other features, Yarn lets you determine how long to keep messages you've read. Yarn also has a provision for archiving messages that you'll want to keep around. Another distinct advantage is its ability to search offline articles for matching text.

As a message reader, Yarn is functional, but spartan. If you're used to having context-sensitive help for example,

forget it. When you press <F1>, you get a scrollable text window of the whole help file (which isn't very large). If you want different colors—the defaults are pretty hard for some people to read—you'll need to manually edit a configuration file.

Another area of difficulty is Yarn's text-only interface (Figure 2). It's terse and nonstandard (no menu and no objects). To become fully proficient with Yarn, you'll need to learn a lot of one-character keystroke commands. Moreover, commands are case-specific. While lowercase <r> means "mail reply," an uppercase <R> means "mail reply quoting original article." If you're a big-time newsgroup junkie, you might not mind learning a completely new and unusual interface. If you're the average user, however, you might settle for NewsReader/2 or Neologic News, despite some shortcomings.

Netcomber and other options

OS/2 users have a number of other newsreader options. For users who desire a simple, one-interface-fits-all approach, there's IBM's Netcomber suite (Figure 3), which still hasn't been released. While we can't guess the about the future status of Netcomber, it offers a fairly simple interface for news, mail, the Web, and Internet Relay Chat. This simplicity comes with a price, however, in that Netcomber is slow and memory-hungry. When and if Netcomber is finished and released, however, those facts might change.

Netcomber suffers from all of the limitations of NewsReader/2 and

Neologic News. The only advantage is simplicity. The simplicity factor is shattered, however, by the fact that you must manually edit Netcomber's *comber.ini* file to change significant settings. The program also suffers from far too much rigidity. For example, changing news servers completely befuddles Netcomber. Unfortunately, when you change news servers, Netcomber, unlike NewsReader/2, can't be coaxed into using a different newsgroup list without first deleting or moving the existing list. All in all, Netcomber is a pretty ineffective way to read newsgroups, given the alternatives. The fact that Netcomber depends upon other programs for its operation makes it a weak replacement for NewsReader/2.

One product, however, is even worse than Netcomber for reading newsgroups: WebExplorer. WebExplorer can be used to read news-

Resources:

NewsReader/2 1.2.5 (included with OS/2 Warp)

IBM Corp.
Latest version available using the Retrieve Software Updates object in the IBM Internet Connection for OS/2 folder.

Neologic News 4.5 (\$25)

Neologic Software Systems
Fax (613)-735-5519
E-mail gutz@hookup.net
READER SERVICE NO. 101

Netcomber 0.9.7.6 beta (no charge at present)

IBM Corp.
WWW <http://www.raleigh.ibm.com/ncr>

WebExplorer 1.1b (included with OS/2 Warp)

IBM Corp.
Anonymous FTP <ftp://ftp.ibm.net/pub/WebExplorer>

Soup 1.5 and Yarn 0.90 (freeware)

Chin Huang
E-mail chhuang@io.org
Anonymous FTP [ftp.oce.com/pub/yarn](ftp://ftp.oce.com/pub/yarn)

groups, but the current version makes for extremely slow and clumsy reading. The newsgroup manager is poorly designed, requiring a full refresh from the server each time you need to view the full list of newsgroups. Worse, the full listing is hierarchical, with groupings that aren't very useful to someone who's searching for a key word. Subscribing to newsgroups using the WebExplorer is almost impossibly tedious.

A number of Windows options, some of which work well under WinOS/2, also bear mentioning. The two most popular dedicated newsreaders for Windows are WinVN and FreeAgent. Although it's beyond the scope of this article to review these products, suffice it to say that both of these are freeware programs that offer, to varying degrees, the same kinds of functionality found in Neologic News and NewsReader/2. Additionally, Netscape Navigator manages to be a pretty competent newsreader. Navigator also fully integrates the decoding of binaries, not only decoding uuencoded files auto-

matically but displaying them in the Navigator window.

Bottom line

For most Usenet users, IBM's NewsReader/2, which comes free with OS/2, works just fine. And the price is right. It's reasonably fast and easy to use. Of the various newsreaders explored for this article, NewsReader/2 has the most ergonomic interface (except for decoding binaries), requiring less work and less arm movement to get connected and start reading articles.

If you require offline capabilities, however, or if you must access a news server that asks for user name and password, then Neologic News is your choice. Neologic offers a comfortable and attractive PM interface, with a usable method for saving and organizing messages offline. Of the OS/2 newsreaders, Neologic is the only one that offers passworded access to news servers (at this time).

If you maintain extensive collections of news articles offline, you'll probably benefit by learning how to

use Soup and Yarn. While not even bordering on intuitive, this combination offers a cost-effective (free) way to access messages. Moreover, Yarn is the only OS/2 newsreader we found that offers the ability to search through articles stored offline. **OS/2**

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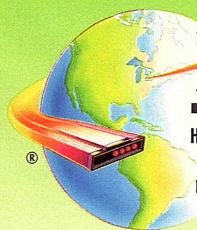
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Migrating to VisualAge C++

Tips for making your C/C++ code portable across OS/2 compilers.

By David Moskowitz

When it comes to choosing development platforms and tools, the grass is often greener on the other side of the fence—but it's usually harder to chew. In other words, developers are often tempted to make changes, such as from one language to another or from one dialect to another. Good in theory, difficult in practice. If you don't take the time and make the effort to write portable applications, you may experience unexpected horrors when converting code to IBM's VisualAge C++ from another dialect of C or C++.

Sometimes the effort is painless, especially for small programs. However, if you try to convert a large program, you may discover unanticipated problems unrelated to the language. For example, if you're using Borland's integrated development environment (IDE) and you convert the code to IBM's VisualAge C++ compiler, besides coping with the language differences, you'll also have to learn a new editor and a new way of managing projects and source code.

Command-line parameters are rarely the same; MAKE files have to be reconstructed. If you have a third-party MAKE utility, you will have to edit the script for the new compiler. If you use the vendor-supplied MAKE utility, you should be able to use the MAKE file creation tool included with VisualAge C++.

Writing perfectly portable C or C++ is certainly possible. However, you have to avoid any compiler-specific constructs or library calls. In addition, the vendor may have implemented OS/2 "wrapper" functions differently. Similarly, if the OS/2 toolkit levels are not the same, you may also have problems. Bottom line: If you want to move development to a new compiler, you have some work to do. While some elements of the language are standardized, many parts aren't.

Before we forget: Do *not* try to convert Borland's OWL class library code to Open Class. There isn't a direct conversion. If you've made extensive use of OWL, either live with it or bite the bullet and rewrite the code in Open Class. In this article, we've used a lot of Borland-to-IBM examples, not because more people are migrating from Borland to IBM, but because the conversion is more complex. The general principles would apply to any C/C++ compiler.

Get ready, get set

Okay, you've made the decision to port code over to VisualAge C++. First, make sure you've run the code through the highest warning level that your old compiler offers and eliminated every warning message. A better approach is to use PC-Lint from Gimple Software and clean up any problems it reports; PC Lint is significantly more stringent in its evaluation than even the best compiler.

If you have PC-Lint, you can change the various paths to the VisualAge C++ directory tree early, so you can fix the code for the new compiler (make sure the **INCLUDE** variable points to VisualAge's directories). This approach

Why VisualAge C++?

OS/2Developers have four compilers available to them. We chose to target IBM's VisualAge C++ for these reasons:

① VisualAge C++ appears to be the compiler with the most active development and complete set of OS/2 tools and libraries. Watcom provides out-of-the-box portability between Windows and OS/2 and includes 16-bit development tools; however, it does not currently include support for IBM's increasingly popular Open Class library.

② We've ported applications between Windows NT and OS/2 Warp (using the respective compiler versions of VisualAge C++). IBM released VisualAge C++ for Windows as a separate product earlier this year. According to IBM, the plan is to converge the products and provide out-of-the-box portability before the end of this year with the 4.0 product. To get this degree of portability with the Windows 3.5 and the OS/2 3.0 compilers, you must limit the classes you use in Open Class to the common subset. This restriction isn't quite as limiting as it might sound. Open Class is a very rich library.

③ Of the three other OS/2 compilers, Borland's offering is desperately in need of an upgrade; Watcom provides more support for Windows development than it does for OS/2; and Metaware's compiler is still character-based. None of the three provide current header files for OS/2 Warp. None of the three vendors were as responsive as IBM in responding to problem reports.

Migration

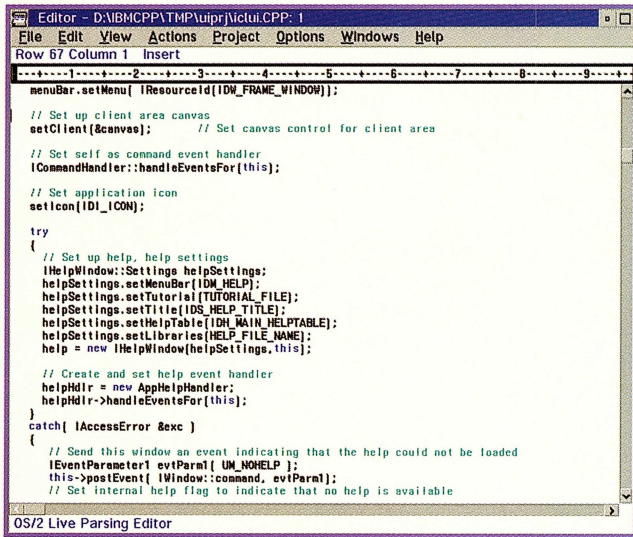


Figure 1: IBM's OS/2 Live Parsing Editor.

also helps identify not only header file changes but also prototype differences. For example, Borland C++ provides an *alloc.h* header file that isn't part of the IBM offering. However, because the same declarations are also included in *stdlib.h* (in both Borland and VisualAge C++), this set of functions usually doesn't present much of a problem.

If you've used the complete set of Borland's *dir.h* functions, you have some manual conversion. IBM supports a subset of these found in *direct.h* (Table 1). For some functions, such as Borland's *findfirst()*, you may be able to substitute the OS/2 API call—in this case *DosFindFirst()*—though it has a different parameter set. The moral of this story is that you cannot avoid the compiler documentation. Some things, such as *findfirst()*, won't have a direct counterpart, so you'll have to rewrite manually. Still, most functions, such as *getcwd()*, won't require changes.

Making conversions

For a multithreaded application, the most common code candidate involves the *_beginthread* function. IBM uses the old Microsoft convention with four parameters; the Borland approach uses three. For example, the original call in Borland C++ looks like this:

```
tid = _beginthread(pfnThread, ulStackSize, ,
    pParamList);
```

The IBM version uses four parameters for the same code.

```
tid = _beginthread(pfnThread, NULL, ulStackSize, ,
    pParamList);
```

Once you discover this difference exists, it is a simple matter to construct a preprocessor macro to add the missing parameter, such as

```
#ifdef __IBMCPP__
    #define THREAD_NULL NULL, NULL
#else
    #define THREAD_NULL NULL
#endif
```

This code makes use of a compiler-defined variable *__IBMCPP__* that is automatically defined in the VisualAge environment.

If you're preparing for an eventual migration to VisualAge C++, but intend to continue development in Borland C++, you can recode the single line as follows:

```
tid = _beginthread(pfnThread, THREAD_NULL, ,
    ulStackSize, pParamList);
```

This approach highlights the different syntax between the two compilers. You could hide the specifics with a different approach. Use a text editor to change all occurrences of *_beginthread* to something else, say *BEGINTHREAD*, and then place the following in your header file:

```
#ifdef __IBMCPP__
    _beginthread(pfn, NULL, ul, p)
#else
    #define BEGINTHREAD(pfn, ul, p) ,
    _beginthread(pfn, ul, p)
#endif
```

Table 1: Comparison of Borland's *dir.h* and VisualAge's *direct.h* header files.

Function	Borland (<i>dir.h</i>)	IBM (<i>direct.h</i>)
<i>_chdrive</i>		yes
<i>_getdcwd</i>	(see <i>getcurdir</i>)	yes
<i>_getdrive</i>	(as <i>getdisk</i>)	yes
<i>chdir</i>	yes	yes
<i>findfirst</i>	yes	
<i>findnext</i>	yes	
<i>fnmerge</i>	yes	
<i>fnsplit</i>	yes	(as <i>_splitpath</i> in <i>stdlib.h</i>)
<i>getcurdir</i>	yes	(see <i>_getdcwd</i>)
<i>getcwd</i>	yes	yes
<i>getdisk</i>	yes	(as <i>getdrive</i>)
<i>mkdir</i>	yes	yes
<i>mktemp</i>	yes	
<i>rmdir</i>	yes	yes
<i>searchpath</i>	yes	
<i>setdisk</i>	yes	

Useful VisualAge Compiler Options

VisualAge C++ compiler options are not case sensitive. In addition, the slash (/) is interchangeable with the dash (-). The following table uses the slash:

Option	Description	Recommended for conversion
/C[+ -]	Perform compile without linking	/C+
/Fc[+ -]	Perform syntax check only	/Fc+
/Gt[+ -]	Enable variables for passing to 16-bit functions	/Gt+ if you need thunk code; otherwise /Gt- (default)
/J[+ -]	Treat unspecified char variables as signed char	If your code assumes unsigned use /J-; otherwise the default is /J+
/Nn	End compilation when error count reaches n errors	Omit this parameter for no limit
/O[+ -]	Optimize code	/O- (disable optimizations; the default)
/Sn[+ -]	Allow DBCS	If your code needs it then /Sn+; otherwise the default is /Sn-
/Sp[1 2 4]	Specify alignment or packing of data items within structures and unions	The default is on a 4-byte boundary (/Sp4); change as needed
/Ss[+ -]	Double slashes to indicate comments	/Ss+ if you use //; the default is /Ss- for C and /Ss+ for C++
/Ti[+ -]	Generate debugger information	When you're ready add /It+ to the compile options
/W[0 1 2 3]	Controls level of diagnostic information	The default is maximum warning /W3; leave it there
/Wgrp	Types of syntax warning evaluation	/Wall — this will generate lots of output, but it is very helpful

While on the IBM side it would appear as

```
#define OPENFLAG "a+"
```

The time and date functions in the Borland compiler also need revision when moving to VisualAge. For example, in Borland's syntax we use the following approach to get the time:

```
volatile struct date Date;
getdate((struct date *)&Date);
sprintf((char *)szDate, "%02d%02d", Date.da_day, Months[Date.da_mon], ((Date.da_year-1900)%100));
```

VisualAge's code to perform the same function is

```
const struct tm *pt;
volatile time_t t;
t = time(NULL);
pt = localtime(&t);
strftime(szDate, sizeof szDate, "%d%b%y", pt);
```

In both cases, the variable **szDate** is passed as a parameter to the function containing this code. The IBM compiler provides a function to convert the **timePtr** to a character string, rather than use **sprintf** to parse the components of the **Date** struct.

Tools and such

For years I've used BRIEF as one of my programming editors—I have nearly a megabyte of macros that I have not converted to other editors. I also use Visual SlickEdit, and I've become somewhat familiar with EPM, OS/2's Enhanced Editor. Consequently, I've never really paid much attention to various IDEs. Your experience may be different; some say that the choice of editors and IDEs is probably the biggest cause of arguments between programmers!

Borland and Watcom provide an editor as an integral part of their IDEs. IBM supplies LPEX (OS/2 Live Parsing Editor) as a stand-alone editor (Figure 1). LPEX is significantly more customizable than the IDE editors, and its macro language is REXX.

IBM's IDE is the WorkFrame/2,

I prefer this second approach as it highlights the change required to **__BEGINTHREAD** and not the specific parameter.

Some file manipulation is still required. For example,

```
#ifdef __IBMCPP__
#define MYOPEN(fn,type) fopen(fn,OPENFLAG);
#else
#define MYOPEN(fn,type) _fsopen(fn,OPENFLAG);
#endif
```

If you intend to preserve both source trees for a while, Borland's **_fsopen** takes additional parameters not used with the IBM compiler. The function prototype for Borland's function is **_fsopen(filename,mode,ShareFlag)**, while the IBM **fopen** uses the prototype **fopen(filename,mode)**. Thus, you need additional macros to define the **OPENFLAG** variable. On the Borland side, for example,

```
#define OPENFLAG "a+", SH_DENYWR
```


which looks somewhat like a standard OS/2 folder with extensions for managing coding projects. Work-Frame/2 provides hooks to the editor that you can change to suit your needs. It also allows you to invoke the other tools in the IBM compiler set, such as the debugger and profiler.

If you use an IDE, you can make LPEX look somewhat like the editor you know. For example, IBM supplies the file (*epm.lx*) that allows LPEX to mimic EPM. You can use this file as a starting point to change the behavior to approximate the editor keystrokes you want. In addition, LPEX recognizes various languages (including RPG) and changes its behavior accordingly. (If you're interested in this technique, check out the files in the \macros and \macros\code subdirectories.)

No firm rule

Despite compiler makers' claims, you cannot predict the amount of time needed to convert your code from one compiler to another. Some tech-

niques can help minimize the effort, however. First, keep the compiler and system-dependent code as modular as possible—highly modular code that isolates system functions pays for itself.

Wherever possible, encapsulate one system- or compiler-specific call of each type in a programmer-defined function. For example, you might have one `_beginthread` call in the code, written to be generic, and then invoke it as many times as necessary to create the threads you need. This way, as you change compilers, only the single function needs to be changed (and maybe the function prototypes and declarations if the calling conventions or return values change—you'll get this information from the `lint` run).

No matter what approach you choose to take in the conversion process, you should run the resulting executables through a complete regression test. You may find problems with your code masked by the original environment. **OS/2**

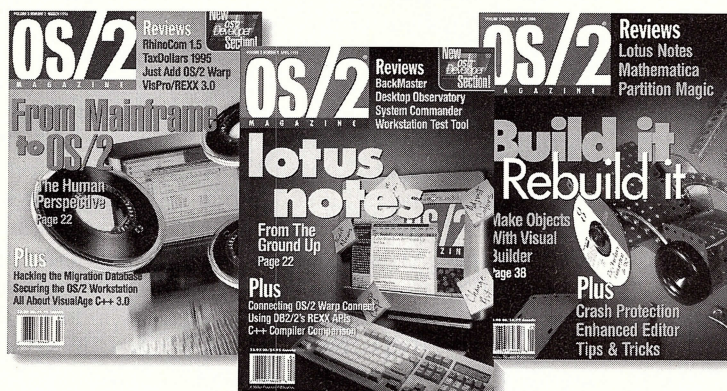
David Moskowitz is president of Productivity Solutions, a Norristown, Penn.-based consulting firm specializing in OS/2 and object-oriented development. He is a contributing editor to OS/2 Magazine and a featured author of OS/2 Warp Unleashed. He can be reached at CompuServe 76701,100 or dmoskowitz@cis.compuserve.com.

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Ten Rules for Distributed Object Systems

BY ROGER SESSIONS

It's sad watching a client fail. Recently one of my clients failed. The company had attempted to build a relatively simple distributed object system. About 10 person-years had been invested in the project. The company had promised that the next major release of this product would be based on distributed objects. The project had high visibility. And the whole thing went down the drain.

Like most failures, this one was predictable. The developers had little experience in object-oriented programming, no expertise in distributed object systems, and almost no time allocated for training. They immediately started designing an overly complex system with no provision for testing or debugging.

As the second extension of the project due date approached, the project managers started getting desperate. The system was slow and lacked much of the committed functionality. What functionality it did have would occasionally work, but more often would hang or crash. No one had any idea why it worked when it worked, and why it didn't when it didn't.

So the managers made a desperate move. They called in a consultant: me. They told me they had to ship within two weeks. They wanted me to tell them how to fix their problems—in less than two days.

I spent a day with them reviewing the design. I had no choice but to deliver the bad news. The design was a mess. The implementation was hopelessly flawed. The best option was to flush it all and start again.

I tried to sound as positive as I could, given the depressing circumstances. I used phrases like, "This is an

excellent prototype that should help clarify your goals," and "This is a really nice demonstration of a system bottleneck—see how all these little arrows are all pointing at the same object?" But the message was clear. The team had no hope of meeting its deadline. The system had no more chance of working than a dog has of flying.

This situation started me thinking. Obviously, this client had violated many of the basic rules of developing distributed object systems. But just what are these rules?

Over the many years that I've been in this field, I've designed, implemented, and consulted on many distributed object systems. I've given lectures at more conferences than I can count and spoken to more people than I can even guess at about using distributed objects. I've heard and witnessed many stories of success and many of failure. So what determines success or failure when using this technology?

When a distributed object system works well, it is beautiful and harmonious. When it doesn't, it's repugnant and irritating. So what makes one distributed system a symphony, and what makes another a cacophony?

I believe in 10 basic rules for implementing distributed object systems; rules so basic that anyone observing all 10 is almost guaranteed success, and anyone who ignores even one is headed down a dark path indeed.

Rule one

Understand what a distributed object is (and isn't). This is a funny rule, isn't it? Why would people use distributed objects without understanding what they are? However, this rule is commonly violated.

Many people begin with an incomplete understanding of object-oriented programming and then try to extrapolate this pseudo-understanding to distributed objects. Others who do understand object-oriented programming then assume distributed objects are the same thing. They are not.

Distributed objects are more like components than objects. They are large things that know how to perform specific functions for you. They generally provide some kind of business capability.

Let's consider a few of the traits that differentiate nondistributed objects (such as C++ objects) from distributed objects.

- **Purpose.** The purpose of a nondistributed object is to manage the complexity of the data and algorithms required to solve some programming problem. A good example of a nondistributed object is a collection class. The purpose of a distributed object is to perform a related set of business functions for multiple remote clients. A good example of a distributed object is an inventory object.
- **Client view.** The client view of a nondistributed object is a class, which includes the definitions of methods, the algorithms for those methods, and the internal data of a nondistributed object. A given class can have only one implementation. The client view of a distributed object is an interface, which only defines the behaviors that clients can expect the distributed object to perform. A given interface can (and often does) have many implementations.

The World of Objects

■ **Performance.** The cost of a method invocation on a nondistributed object is measured in tenths of a microsecond. For a nondistributed object, you can ignore the invocation costs of methods when determining its performance. The cost of an operation invocation on a distributed object is measured in milliseconds. You must consider this cost very carefully when analyzing the overall system performance.

■ **Complexity.** A nondistributed object is typically low in complexity and is often composed of only a few hundred lines of code. The design goal of nondistributed objects is to be simple. A distributed object is usually quite complex and composed of perhaps hundreds of thousands of lines of code—a single distributed object may actually consist of dozens, or even hundreds, of local, nondistributed objects, but if so, their existence is invisible to the client.

■ **Number.** Nondistributed-object-based systems are typically composed of a large number of classes (perhaps thousands) and an even larger number of nondistributed objects. Distributed-object-based systems are typically composed of a small number of interfaces (perhaps 10) and not many more distributed objects (perhaps dozens at most).

■ **Location.** Nondistributed objects are always located in the address space of their clients. Distributed objects are never located in the address space of their clients.

■ **Concurrency.** Nondistributed objects are only used by a single client and don't have to worry about concurrency. Distributed objects are used by a large number of clients and have to deal with complex concurrency issues.

Rule two

Use a standard. Distributed object systems by their very nature need to span languages, computers, operating systems, and network protocols. Your only hope of managing this complexity

is to base your distributed object systems on well-understood standards with many available implementations.

The most widely recognized distributed object standard is the CORBA standard, based on work done by the Object Management Group (OMG). Fortunately, one of the industry's best implementations of this standard is available to OS/2: SOMobjects. SOMobjects will soon be available on all IBM platforms and many non-IBM platforms as well. OS/2 is therefore an ideal platform for developing distributed object systems.

Basing your distributed object system on the CORBA standard will give you the following important benefits:

■ You will have the widest possible choice of machines on which to place objects. Objects that need close integration to databases can be placed on the database host. Objects that need high reliability and scalability can be placed on a Tandem machine, which has ported a version of SOM designed to support such features. Objects that make use of special AS/400 features can live on that host.

■ You won't have to worry about underlying communications protocols. The CORBA architecture hides communications protocols under operation invocations. You will never know what communications protocol you are using.

■ You won't have to worry about the language that is being used to implement your objects. Because CORBA is a well-accepted standard, it is or will be supported by most popular programming languages.

■ You will have access to objects being developed by independent software houses. The CORBA standard is expected to enable a whole software components industry.

■ You will have access to a host of well-defined object services, such as persistence, security, naming, events management, and many others. These services will simplify your systems development and increase the portability of your products.

■ You will be independent of any one vendor. Although IBM's SOMobjects is one of the leaders in the field, there are at least five other significant competitors that offer CORBA implementations.

Rule three

Design distribution into the system from the beginning. If you have followed rule one, then you understand the difference between regular objects and distributed objects. Rule three says you should deal with the various distribution issues from the beginning of your design. You don't need to implement every design feature immediately. In fact, it's better to get the basics working before you worry about the details. However, you should understand and plan for the problems that may arise as you move to a highly distributed system.

You should consider the following issues, most of which are irrelevant for nondistributed objects:

■ Where will your distributed objects live, and why?

■ How will information pass between the distributed objects?

■ What is the maximum throughput for each distributed object, and where in your overall system will bottlenecks occur?

■ How many users must the system be prepared to accommodate?

■ How will your system scale up when the number of users increases, anticipating, at worst, that your system actually works, and the whole world wants to use it?

■ How will distributed objects be instantiated and de-instantiated?

■ How will users find the distributed objects they need? Will they use a naming service, a trading service, or some other mechanism? How will the objects become registered with the appropriate services?

■ How reliable do you need the object references to be? If a process has a reference to a remote object, and the server containing the remote object goes down, what are your expectations of the system?

■ How will your distributed objects

keep their states synchronized with external databases?

- How will your distributed objects participate in transactions?

Rule four

Figure out how your distributed objects will interact. Typically, the interactions between nondistributed objects are fairly simple. A client object knows about a target object either by maintaining a reference to the target object as part of its state or by having the target object passed in as a parameter to one of the client object methods. The client object then invokes methods directly on the target object.

The interactions between distributed objects include many more possibilities, in terms of both how client objects find target objects and how the client objects invoke methods on the target objects.

Strictly speaking, a distributed client object never has a direct reference to a distributed target object. Instead, the distributed client object has an indirect reference that is interpreted by the server on which the target object lives. Thus, the server always has an opportunity to redirect the method to another object, or another server, should it choose to do so.

Even indirect references are not commonly used by client objects. A client object will more commonly use a naming service, trading service, or property service to find an appropriate target object with which to interact.

Sometimes, no direct interaction occurs between a client and its target distributed object, as when the interactions go through the event service. When using an event service, one object may simply notify the world that a particular event has occurred, and any object that wants to deal with that event is free to do so.

These examples are just a few of the possibilities for distributed object interaction. You need to understand what possibilities exist and which will best meet your needs.

Rule five

Avoid writing code whenever possible. The CORBA standard is particularly suited to code reuse. The opportunities for code reuse fall into two general areas: buying and wrapping.

Because you have been so clever as to build your system on a well-accepted standard (see rule two), you will have more opportunities to purchase prebuilt distributed objects. Because you have been so clever as to choose a standard that is object-based, rather than component-based, you can easily specialize these objects to do exactly what you want. This discussion is a bit futuristic, since the market for object-based components is still in its fledgling stages, but the future is bright.

When you cannot purchase, you can often wrap. Because CORBA has a clean separation between interface and implementation, a client has no dependencies on how a method is actually implemented. A method can be implemented by wrapping an executable program, an existing object method, a subroutine, a shell script, a stored function in your database, or almost any code package you can imagine.

Do not fall into the trap of thinking you must implement every distributed object operation from scratch. Search every nook and cranny for reuse opportunities.

Rule six

Prototype. Okay. You think you're smart. You've followed rule one and think you understand what distributed objects are. You've followed rule three and have done a careful distributed system design. You've followed rule four, and understand all the interactions between your distributed objects. But you aren't smart. You're stupid. If you know you're stupid, then there's still hope for you. If you think you know what you're doing at this point, then you're in serious trouble.

Now is the time to roll up your sleeves and prototype. Make sure the logic of your operation implementations actually works. Make sure that the object interactions work the way you thought. Make sure the servers' robustness matches your expectations. Make sure the system scales up as predicted. Make sure the performance of operations is as you expected. I assure you, you will find more design problems in the first two weeks of prototyping than you would in six months of arguing on whiteboards.

In reality, there is no such thing as skipping the prototyping step. People merely delude themselves into believing that they can do so. They will learn the hard way.

Don't be ashamed of being stupid. I am stupid, and I've probably been in this field a lot longer than you have.

Rule seven

Distribute incrementally. Testing and debugging are more difficult when objects are distributed than when they are nondistributed, and more difficult still when they are distributed remotely than when they are distributed on the same machine.

You should, therefore, locally test as much of your system as you possibly can. The technology for debugging and validating nondistributed objects is far more advanced than the technology for debugging and validating remote objects. Once you have everything working locally, move the objects onto other processes on the same machine. Once that works, move the objects onto other machines.

You may be tempted to skip this step, but you'll pay dearly if you do. You'll spend weeks trying to find problems that would've been obvious in local mode with a good debugger.

Rule eight

Spend your time designing, not choosing design tools. Keep in mind that distributed systems are composed of a relatively small number of complex objects. You really don't need complex design tools to design distributed object systems. I've seen many projects where protracted religious wars were fought over design methodologies. I've yet to see one project where the choice of a particular design methodology or tool made a bit of difference to the eventual success or failure of the project.

Some design tools claim to directly produce IDL (the language that describes the interfaces of CORBA objects). I say, "Who cares." IDL isn't that difficult to write. Use whatever tools you want. Just keep them simple. And don't waste a lot of time arguing about them.

Rule nine

Allow time. Many projects get into the distributed object arena thinking it

will allow them to develop their first system in a fraction of the time it would take using conventional technology. Please. Get real.

If this project is your first, you have a lot of learning to do. Your team's first learning task is to make sure they really understand object-oriented programming. Once they've gotten past that hurdle, they need to understand distributed objects. The leap from nondistributed object-oriented programming to distributed object-oriented programming is at least as great as the leap from procedural to object-oriented programming.

It will probably take people a long time to master these new ideas. They are going to make many mistakes (see rule six). Plan adequate time for learning the theory of distributed objects and the many parts of the CORBA architecture. Plan for lots of hands-on training time. Eventually, you'll get to the point where your system development time is dramatically reduced, but not on your first system.

Rule ten

Focus on expertise early. You cannot design and implement a decent distributed object system without some expertise on board—not only expertise in object-oriented programming, but expertise in distributed object systems.

If you have in-house experts, bring them in early. If you don't, hire a consultant and do so before you have your first design meeting. You may only need a few weeks or a few months of a consultant's time. Whatever you need, the cost of bringing in a consultant is minuscule compared to the cost of spending person-years going down rat holes and blind alleys that could have been avoided, or of building systems that fail the first time your customers try to use them.

Speaking as one who has been there, I can tell you: It's a lot more gratifying to help design and build a system that works well than it is to have to tell somebody, after the fact, that a brand new, multimillion dollar creation isn't worth the disk space on which it's written.

Epilogue

That's it. My 10 rules for developing and implementing distributed object systems. Perhaps I should have added an eleventh rule: Have fun. This is a great technology. It's fantastic to conduct an orchestra of distributed objects, each doing its own unique thing, yet cooperating in a wonderful, harmonious, symphonic movement.

OS/2 is an ideal platform for trying out this technology. Now go to it. Create a masterpiece. **OS/2**

Roger Sessions is president of Object-Watch Inc. His latest book is Object Persistence: Beyond Object-Oriented Databases. Roger also publishes the SOMobjects Home Page (<http://www.fc.net/~roger/owatch.htm>) and an Internet newsletter called ObjectWatch on SOM. He can be contacted via e-mail at roger@fc.net.

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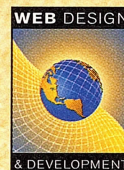
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A Picture-Perfect Control

BY MARK BENGE AND MATT SMITH

In this issue, we'll create a new thread of discussion on another sparsely published area in OS/2 Presentation Manager (PM)—frame windows. More specifically, we'll examine how to extend the frame window control, illustrating the implementation of some useful features that will make your application the "cat's meow."

Miter box not included

What is a frame window and what does it encompass? Visually speaking, the frame window is the cornerstone of an application. It manages a standard set of child frame controls, enabling you to maintain a consistent look and feel across your applications. The child frame controls that the frame window manages are the title bar, system menu, menu bar, and scroll bars. These controls, which are owned by the frame window, can send notification messages to the frame window based on user interaction. Additionally, a frame window can also include items that are not controls: a sizing border, minimize and maximize buttons, and a status window for DBCS-enabled applications.

The difference between OS/2 and Windows with respect to frame windows is that OS/2 PM gives you access to each of the individual controls. Windows doesn't really support the concept of separate frame and client windows; it does have what are known as client and nonclient areas, and it treats the entire nonclient area (title bar, system menu, menu bar, and so forth) as one big happy family.

Although the frame-window control is rich in functionality, you may have a competitive need to extend

the control. For brevity's sake, we'll henceforth identify this exercise as a frame extension. Let's first take a peek at the online *Presentation Manager Guide and Reference* to see if it sheds any light on the subject.

Where oh where are you tonight?

In case you blinked, the *Presentation Manager Guide and Reference* section that contains information on frame extensions is titled "Nonstandard Frame Windows." It states that "an application can create a nonstandard frame window either by subclassing a

minimal work, as you only intercept messages of interest and allow the default procedure to do the rest of the work. Creating a private window class involves more work, but is more flexible and extendible. Those of you who already know us know what our approach will be, but for the benefit of new readers, we're lazy. Therefore, we will use subclassing.

Framing materials

The *Presentation Manager Guide and Reference's* "Nonstandard Frame Windows" section states that "the messages WM_FORMATFRAME, WM_UPDATEFRAME, and WM_CALCVALIDRECTS control the arrangement of frame controls for applications that subclass the frame-window procedure." For our sample program, we utilize WM_FORMATFRAME, WM_UPDATEFRAME, and a message not listed: WM_QUERYFRAMECTL-COUNT. We don't require the level of granularity provided by WM_CALCVALIDRECTS, so we do not use it in the sample. The *Presentation Manager Guide and Reference* also states that "by intercepting these messages, an application can rearrange the frame controls in a frame window." We do not want to rearrange the frame controls. We want to add new frame controls to extend the functionality of the frame.

Building the frame

As previously mentioned, we process WM_FORMATFRAME, WM_UPDATEFRAME, and WM_QUERYFRAMECTL-COUNT. WM_UPDATEFRAME is used to signal the frame that frame extensions have been added to the frame window. After subclassing the frame window, we send

Table 1: FID_* indexes.

FID_SYSMENU	0x8002
FID_TITLEBAR	0x8003
FID_MINMAX	0x8004
FID_MENU	0x8005
FID_VERTSCROLL	0x8006
FID_HORZSCROLL	0x8007
FID_CLIENT	0x8008
FID_DBE_APPSTAT	0x8010
FID_DBE_KBDSTAT	0x8011
FID_DBE_PECIC	0x8012
FID_DBE_KKPOPUP	0x8013

frame window or by creating a private frame-window class. An application that subclasses a frame window can intercept the messages sent to the window and process them in new ways. An application that creates private frame-window classes essentially rewrites the frame-window procedure." So, shall we subclass or create a private window class? Each approach has its merits. Subclassing involves

this message from `main()` to force the update of the frame. OS/2 PM responds to this message by sending `WM_QUERYFRAMECTLCOUNT` and `WM_FORMATFRAME` to the frame window. Our subclass procedure, `FrameWndProc`, processes both messages. PM sends `WM_QUERYFRAMECTLCOUNT` to determine the number of frame controls. It uses this number to allocate the SWP (Set Window Position) array that it passes in `mp1` of `WM_FORMATFRAME`. The SWP array is an array of structures that contain the size, position, and various size and position options for each of the child frame controls on the frame window.

`FrameWndProc`'s processing for `WM_QUERYFRAMECTLCOUNT` immediately calls the old frame-window procedure to obtain the number of frame controls. We increment this number by two prior to returning to notify PM that we are adding two controls (that is, extensions) to the frame. A closer inspection of our sample via the debugger reveals that the default frame-window procedure returns a count of eight frame controls, although based upon our frame control (FCF_) flags, there should only be seven.

We speculate that for performance reasons, PM allocates a minimal number of SWP structures (eight) for the array. A closer inspection reveals seven frame ID (FID_*) values. The eighth FID_* value may be for one of the FID_DBE_* values. The SWP array passed in `WM_FORMATFRAME` will therefore have at least eight entries, and at most, the value indicated by the return from processing of `WM_QUERYFRAMECTLCOUNT`.

`FrameWndProc`'s processing for `WM_FORMATFRAME` immediately calls the default frame-window procedure to query the number of frame controls. In the sample program, the number returned is seven. This number represents the following frame controls:

- the system menu (FCF_SYSMENU),

title bar (FCF_TITLEBAR), menu bar (FCF_MENU), vertical scroll bar (FSF_VERTSCROLL), horizontal scroll bar (FSF_HORZSCROLL), and minimize and maximize buttons (FCF_MINMAX)

- the client that is created by default by `WinCreateStdWindow`.

Note that control count is based on the FCF_* flags.

Iterating through the array allows us to determine which child frame control is represented by each index. Figure 1 shows a visual representation of the sample, indicating the location of each child frame control on the sample's frame window illustrated by each control's frame ID. Table 1 shows each of the defined FID_* values.

We add our frame extensions in the following locations:

- between the system menu and the title bar
- between the title bar and the minimum and maximum buttons.

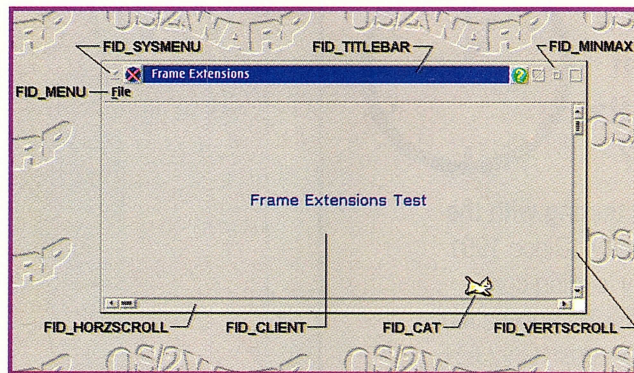


Figure 1: FID_* elements.

We base the position of our frame extensions on the title bar, since it is adjacent to the location of both extensions. Just what are the frame extensions that we are adding? Both are graphic push buttons that are created with the button styles `BS_PUSHBUTTON` and `BS_BITMAP`.

Based on our processing of `WM_QUERYFRAMECTLCOUNT`, we know that the SWP array will contain enough entries to accommodate the extensions. The entries we use for our

extensions start where the number of current frame controls end. In this sample, the size and position information for the current frame controls occupies indexes 0 through 6 in the SWP array, whereas the information for the frame extensions occupies indexes 7 and 8.

The height, width, and vertical (y) position of both extensions is determined by the height and vertical position of the title bar, which we easily obtain from its corresponding SWP array entry. The SWP flags for both are a combination of `SWP_MOVE`, `SWP_SIZE`, and `SWP_NOADJUST`. Likewise, the insert-behind window for both is `HWND_TOP`.

The horizontal (x) for the first extension, henceforth called the close button, is determined by the x-position of the title bar. The x-position for the second extension, henceforth called the help button, is calculated based on the addition of the x-position of the title bar with the width of the title bar minus the width of the help button.

So, are we done? Nope.

We must adjust the x-position and width of the title bar or clipping of the new extensions will occur. The new x-position of the title bar is the current x-position plus the width of the close button. Likewise, the new title bar width is the current width minus double the width of a button.

Last, but not least, we must return the total number of frame controls to indicate to PM the number of SWP array entries it must process. Because the initial number was seven frame controls, to which we added two more, we return a value of nine.

Sanding and putty

The creation and addition of frame extensions is implementation-dependent. The nature of the frame extension is again based upon the implementation. We've taken the liberty of adding a few details to the sample to give you some ideas concerning the

use and additional value of a frame extension. The frame extensions supplied are the close and help buttons. The names specify their applied usage.

The close button is used, as you've probably guessed, to close the application. The button style, **BS_SYS-COMMAND**, was added during the creation of the close button to generate a **WM_SYSCOMMAND** message whenever the close button is clicked. Processing for **WM_SYSCOMMAND** in **FrameWndProc** posts a **WM_CLOSE** message to close the sample.

The help button displays a help panel. The button style, **BS_HELP**, was added during the creation of the help button to generate a **WM_HELP** message whenever the help button is clicked. Processing for **WM_HELP** in **FrameWndProc** sends an **HM_DISPLAY_HELP** message to display the help. The help panel contains additional information about the sample.

If neither the **BS_SYS-COMMAND** nor the **BS_HELP** style is specified for a button, a **WM_COMMAND** message is sent whenever the button is clicked.

Stain and varnish

Now that we've built our frame, sanded the rough edges down, and puttied the nail holes, we would like to discuss more frame extension issues before applying the stain and varnish.

Stay tuned. In the next issue, we seek to build the purr-fect frame for our kitty portraits.

Acknowledgements

Kudos to Mike Walker of the PMWIN development group, IBM PSP; and Hiroshi Tsuji of the Open Class development group, IBM SWS, for their suggestions and assistance in the development of this article. **OS/2**

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Matt Smith, Prominare Inc., Toronto, Ont., is lead architect for Prominare Designer and Prominare Validator as well as the IBM Universal Resource Editor. Involved with OS/2 since 1988, he has a degree in architecture from the University of Waterloo and can be reached at msmith@prominare.com.

Resources:

You can download *framctl1.exe* from these electronic sources:

CompuServe's OS2AVEN forum (OS/2 Magazine section).

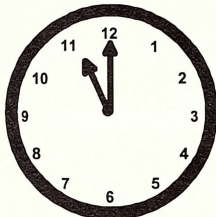
File area 11 on the IBM PCC BBS, (919) 517-0001.

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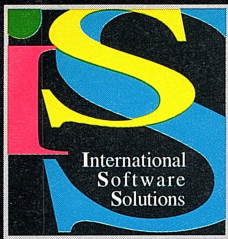
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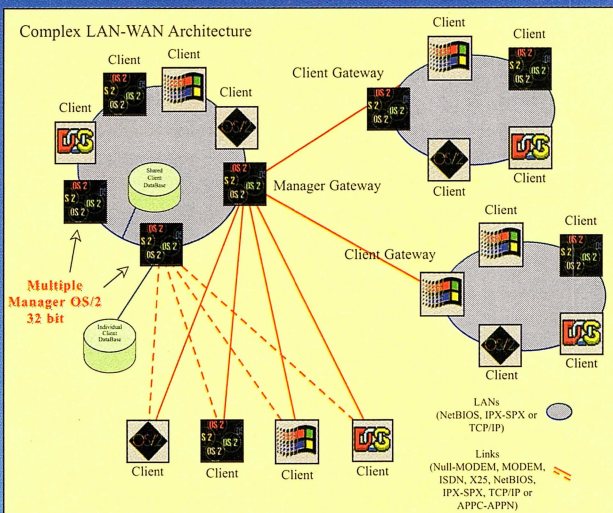
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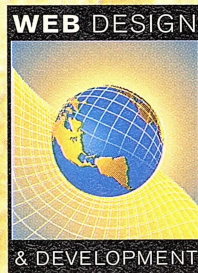
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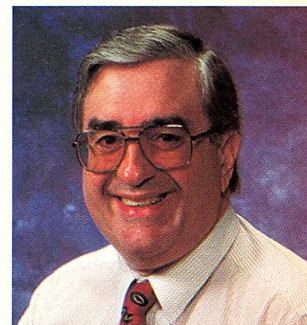
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TSEJr 4.0 and Memory Management Using SPM/2

BY GUY SCHARF



Often, I want a powerful, graphical text editor with more features than you can imagine. But sometimes, I yearn for something simpler. The SemWare Editor Junior for OS/2 (TSEJr), formerly known as QEdit, fits the bill. TSEJr is a compact, yet powerful, character-mode text editor that supports OS/2 nicely. Weighing in at only 80KB of disk space, it still provides mouse support, macro programming, keyboard options, multiple windows, and long file name and extended attribute support. It even includes word-wrap and spell-checking functions. I reviewed version 4.0 using OS/2 Warp Connect.

Ease of use

TSEJr is supplied on one disk. Installation is straightforward using the

supplied DOS installation program. The complete, installed package includes both DOS and OS/2 versions, configuration files, and additional documentation.

TSEJr allows you to tailor the keyboard to suit your needs. Keyboard definition files are included for Brief 2.1, Norton Editor 1.3, PE II, WordPerfect 5, and the venerable WordStar 3.3 layouts. Help files provide online help for the keyboards, and versions are included for all but the Brief layout. Because the keyboard definition and help files are simple text files, you can easily create your own. You use the supplied utility programs to bind the keyboard and help files into the TSEJr executable file.

The configuration program presents a menu of seven areas of customization. Select an area, and you will be given a series of prompts with default answers. You'll probably want to go through the prompts at least once to see all of the configuration options. The options are extensive and include items such as automatic formatting of C code, how the tab key is handled, and colors used for text. Lack of a screen-oriented configuration program makes setting the options somewhat clumsy, but you probably won't need to do this often.

I selected the Brief keyboard layout. I found the editing keys to be emulated well, but the page and document movement keys

are less compatible. TSEJr supports multiple windows, so you can have several views of the same document, or several different documents, visible at once (Figure 1).

TSEJr reads the entire file to be edited into memory and limits the file size to 32MB. Lines may be up to 2,032 characters long.

TSEJr is fast. It began execution and loaded a 110KB source file almost as fast as OS/2's *tedit.exe* or *e.exe* and faster than Brief or other Presentation Manager editors. In paging to the end of the file, it was as fast as TEDIT or E, but not as fast as Brief; scrolling was noticeably slower. TSEJr was faster than any of these in searching for a string that appeared only in the last line of the file.

Menu commands require three keystrokes: the <Esc> key to move to the main menu, the letter for the main menu item, and the letter for the menu item on the pulldown. You can define keyboard shortcuts that map to TSEJr commands. These keystrokes serve as command shortcuts and not menu accelerators.

TSEJr uses the mouse effectively. You can select characters, lines, or columns by left-clicking while pressing the <Option+Shift> key. Right-clicking then pops up a context menu for actions to be taken on the selected block—cutting, pasting, filling, moving, and so on.

TSEJr provides good support for long file names; you can edit and save files with long names. Extended attributes (EAs) are also supported, and the preferences can be set to prompt you for the desired EAs when you save a file.

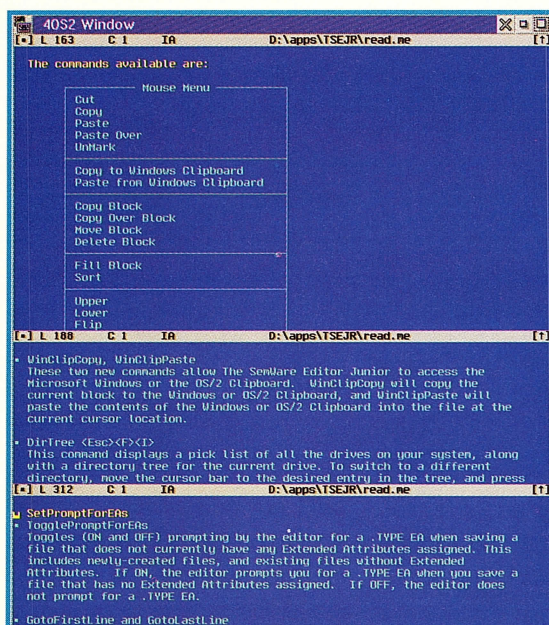


Figure 1: The SemWare Editor Junior for OS/2 4.0.

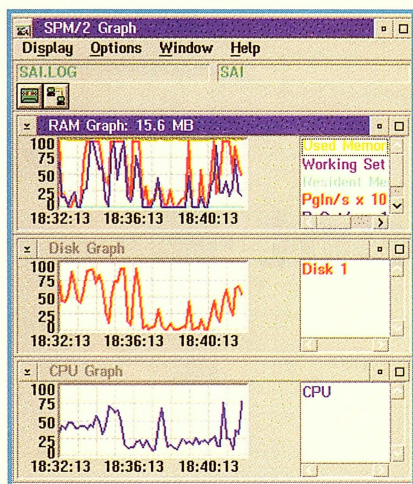


Figure 2: SPM/2 showing paging.

TSEJr lacks a full undo function. An undelete function keeps track of the last few deletions of blocks of text and allows you to retrieve them. But this is not a complete undo facility.

Documentation and support

TSEJr includes a 180-page reference manual. The User's Guide occupies 58 pages and describes keystrokes and commands. A 20-page section provides a detailed explanation of how to configure TSEJr. The remainder of the manual includes a macro-programming and command reference, tables, and an index. Answers to frequently asked questions are provided in text files on disk.

SemWare has a forum section on CompuServe and a BBS for technical support. An FTP site is available both directly and through the company's Web page. Most of the questions on the CompuServe SemWare forum were answered quickly, with a reply posted within a day of the question being asked.

Limits of applicability

With only a single 80K file required, TSEJr is extremely portable and is well suited to the consultant or traveling programmer who needs to carry an editor and other tools on a disk. As a small character-mode editor, it is ideal for making emergency repairs to *config.sys* and other critical OS/2 text files. The ability to tailor the keyboard to resemble other editors allows you to use it as a portable companion to a larger editor.

While strong enough for programming, it does not include color syntax highlighting and other features that may be found in a large Presentation Manager editor.

Summary

TSEJr is a fast, small, easy-to-use character-mode editor. Its small size and single file make it especially useful to those who need a portable tool.

Monitoring memory

Most developers need to pay attention to their applications' memory usage. Even with careful design, issues of memory requirements and pathological behaviors arise, especially when one takes over an existing or partially developed product. The memory management strategies may have been set and would be difficult to identify or change, or users may find new ways to use the product that stress the memory management strategy.

I use a combination of tools and programming to resolve memory management problems. IBM's System Performance Monitor/2 (SPM/2) has two tools that are especially helpful.

SPM/2 is intended as a network monitoring tool. You can monitor CPU usage, disk activity, and RAM use on one or more machines in a network. SPM/2 displays activity graphs with different colored lines to show different activities. One glance at the graph will tell you whether the disk is busy because of application activity or if paging to and from the swap file is the problem (Figure 2). While SPM/2 is not the only product that will report paging activity, the graphical presentation nicely compares use of all resources. These graphs primarily serve to warn that a problem exists; they usually provide the programmer with little clue as to how to fix the problem.

The SPM/2 package includes Theseus2, a system and process analy-

sis tool (Figure 3). It is invaluable in analyzing memory use. The working set analysis function measures the size of the working set of the application over a period of time. You can measure the working set for different aspects of the application to determine how much memory the application requires.

The memory leak analysis function helps track down problems of ever-growing swap files. To use this function, you ask it to capture current memory use. At a later time, you can compare the current memory use with that captured snapshot. Or you can ask Theseus2 to report on memory leakage periodically. The report shows how many more, or fewer, pages of memory are allocated compared to the snapshot, and who allocated the memory. You then need to assess whether the reported additional memory use is normal or constitutes a leak.

If Theseus2 says that the memory was allocated by PMMERGE, then the application may be leaking PM resources. This is not good—such a leak not only takes up memory but may break PM and crash the system. You need to determine what kind of resources are being leaked and then find and fix the problem. The easiest way to determine what kind of resources are being leaked is to install the kernel debugger and the OS/2 PM debug modules. Watch for error messages while the application is run-

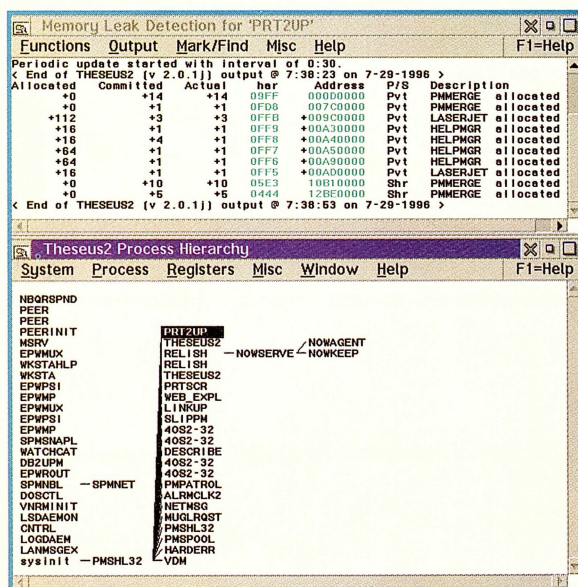
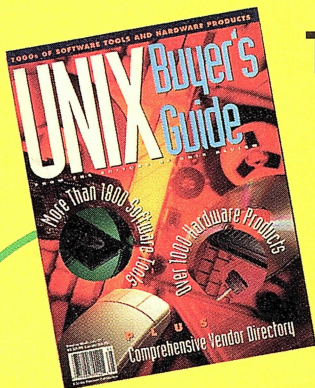


Figure 3: Theseus2 showing increased memory use.

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ning and especially when the windows and application itself are closed. These messages will provide a clue to the type of resources that are leaking. Two common sources of leaked resources are calls to release the resource that fail and calls that are not made. For example, if you release a presentation space that has a clipping region set, the region is not released. If you have not arranged to destroy the region, then regions are leaking, and eventually PM may be unable to draw anything on the screen.

To find memory leaked by the application, many compilers have memory allocation debug tools that will help. You can turn on the memory debug tools in IBM's Visual Age C++ with the /Tm option. Alternatively, you can call `_dump_allocated()` and related functions in your program to create a listing of all currently allocated memory. These snapshots may allow you to locate the memory leak. Using Theseus2, you can examine memory at the addresses shown. Depending on the applica-

tion, you may be able to recognize the data that is leaking.

I find that adding my own memory analysis tools is most helpful. I like to log all memory allocations and deallocations to disk in a debug version of the application. While this slows the application down, it provides complete detail on all memory allocation functions. I can then analyze that data file to examine every allocation and deallocation, match them up, and see where the leak occurred. Because I have a complete log, I can also look for pathological behaviors. In one recent case, I found that an application was using `realloc()` in a way that caused explosive swap file growth. Once the problem was clearly identified, it was easy to fix, and the swap file size is now very stable.

With the proper tools, identifying memory leaks is not difficult. The difficulty of locating and fixing the leak depends on the application design. The better designed the application is, the easier it should be to correct the problem. **OS/2**

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Guy Scharf is president of Software Architects Inc., a software development firm specializing in developing OS/2 Presentation Manager applications for vendors and business. He can be reached at guy@swarc.com.

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Fax	33.3 Data/Fax Modem	33.3 Data/Fax	33.3 Data/Fax	33.3 Data/Fax	28.8 PCMCIA
FDD	3.5" 1.44	3.5" 1.44	3.5" 1.44	3.5" 1.44	3.5" 1.44
Slots	3-PCI / 3-ISA, 1 shared	3-PCI / 3-ISA, 1s	3-PCI / 3-ISA, 1s	3-PCI / 3-ISA, 1 shared	2 PCMCIA
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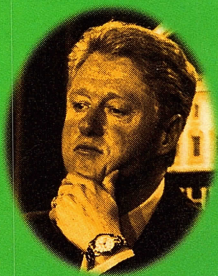
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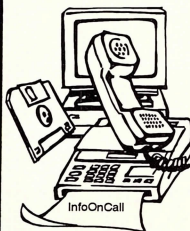
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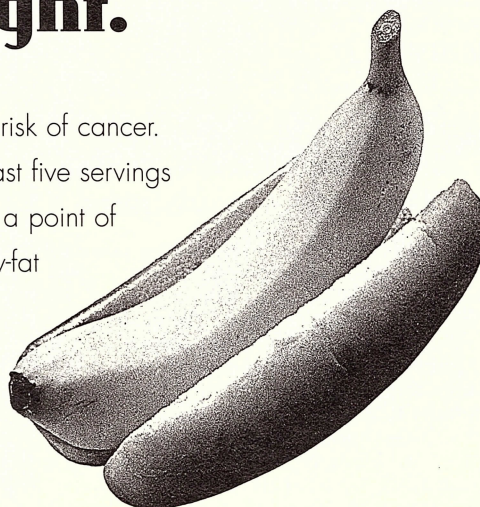
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Pro Crunch Motion

JVIEW PRO 1.0a, NEURALCRUNCH/2 2.06, QUICKMOTION 1.0

BY BRIAN PROFFIT

JView Pro 1.0a

If you're a parent, you're familiar with the phenomenon. One minute, they're cute little things that can't really do very much but are sorta fun. Then, when you aren't looking, they grow up into formidable adults, full of abilities you never imagined.

It seems like only yesterday that I first looked at the shareware JoeView product; I thought it was cute, had some potential, but wasn't worth much of my time. When the folks at Crunch Products invited me to take a look at JView Pro, their new commercial product, I still had that old image in my mind. That lingering image explains the strength of surprise and pleasure I encountered as I started to explore this thoroughly professional graphics product.

It starts with image manipulation

JView Pro supports bitmaps (OS/2 or Windows format), .gif, JPEG (with user selection of compression/quality setting), Portable Bitmap (PBM), .pcx, .png, Sun Raster, Targa, .tiff (with or without compression), and X-11 files natively. But, by exploiting OS/2's capabilities, JView can extend the number of formats it supports. If you have installed the Light Tables in the Multimedia Viewer program in the OS/2 Warp BonusPak, JView can read and write files in any of the file formats you selected for the Multimedia Viewer.

You can also grab images from your desktop using the included screen capture utility. The only op-

tion, however, is to capture the entire desktop. I'd like to see them add the ability to capture only the active window. Still, the program offers a number of ways to crop the image down to the desired area. In addition to normal rectangular cropping, you can mark a region of any shape, and the surrounding area will be filled with a specified color. JView's auto-crop option reads the color of the outside border and works in, attempting to detect where the actual image starts, so that the program can crop appropriately. The more colors in your image, the more difficult it is for JView to auto-crop properly, so a custom crop option lets the user adjust the sensitivity of the cropping algorithm. A higher sensitivity setting makes JView less likely to be fooled, for example, into improperly cropping an image with different shades of blue in the sky. Images can also be resized, flipped, or rotated. JView uses a similar boundary sensing technique (also with adjustable sensitivity) in its "magic" selection tool for marking an entire region with a single click.

Colors can be adjusted using RGB, HSV, HLS, Luv, or CMYK mapping, and there are several methods for dithering those colors for monotone output. More exotic functions such as color remapping and toning allow incredible flexibility in image manipulation. Other image modification tools include blurring/sharpening, embossing/engraving, and shadowing, as well as a range of transformation tools from melting to fish-eye torsion. A custom filter even allows you to create your own transforma-

tion matrix. While playing with the warp transformation, though, I managed to lock up the Workplace Shell (WPS). My system went into a loop in which the WPS went down, brought itself back up, then locked up again.

You can "iconify" images, creating an icon from the image (or selected portion of the image) and associating that icon with the image file. If you use the Drives objects to manipulate files, these icons become a set of thumbnail views of your images. These thumbnails can also appear in the File Open dialog.

When you paste one image onto another, you can instruct JView to blend the two images; or you can make the pasted image completely opaque, where the two overlap, or completely transparent (Figure 1). You can even define individual elements of an image as separate objects. Then, when you paste something into the image, you can specify that it be pasted on top of some objects but behind others—three-dimensional pasting.

When you have your images the way you want them, you can display them in a slide show. Images to be presented can be selected through a dialog, or started automatically by selecting multiple files and dropping them on the JView icon. Slides can be changed automatically based on a timer, and their sequence can be randomized. The sequence can cycle through once or loop continually. You can also determine whether the viewer window changes size with the images or maintains a consistent size.

JView is not just an image tool,



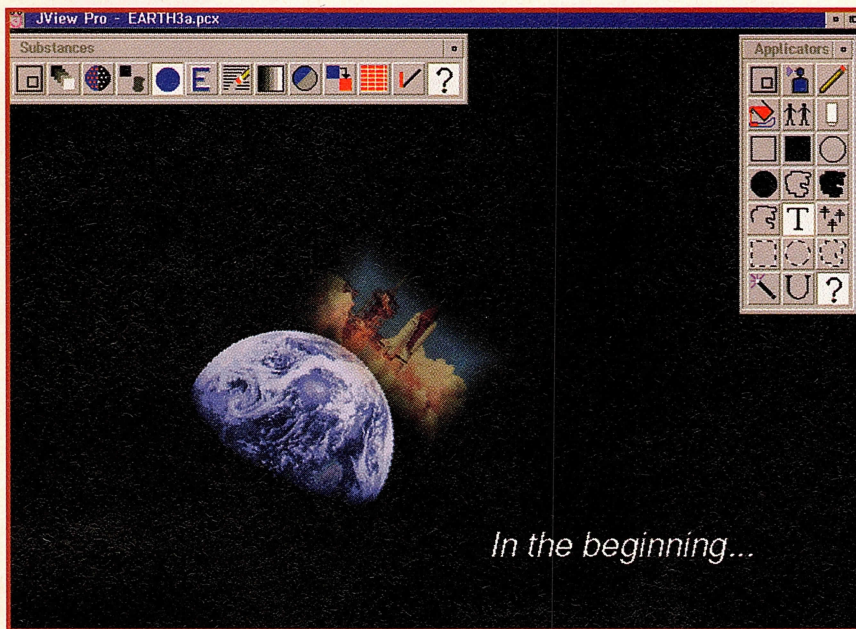


Figure 1: JView Pro makes it easy to blend multiple images.

though; it is also a paint tool. You can configure the intensity, fade characteristics, size, and so on, of the application tools, which include a pen, an airbrush, and chalk. You can also define an applicator of your own creation for such effects as sponge painting, for example.

Somewhat unique user interface

The first time you load the program, JView displays a reminder that all menus are accessed with the right mouse button (or pressing the <m> key). That's a handy tip, since the window has no menu bar. I don't recommend this technique for all programs, but when you're looking at graphics it's nice to be able to devote every spare pixel to the image itself.

The Quick Directory option lets you specify a directory or directories that you will use a lot for images. These directories are available then in a drop-down list in file dialogs, so you can quickly go to those directories without having to navigate the usual tree structure. This feature is one of several innovations found in JView dialogs. Even the buttons in the Substances and Applicators window can be customized to make best use of your limited screen real estate. They can be shown in two different sizes, and as you resize the tool win-

dow, the buttons are automatically rearranged to the new shape. Some of the innovations are quite useful, and some I may never use. Regardless, I appreciate Crunch Products' creativity. I also appreciate the fact that the standard techniques in those dialogs are still available, so we're free to use familiar methods if we choose to do so.

There is an unfortunate by-product, however. You can't use the <Shift> key with the left mouse button to select a range of files in JView's dialogs.

Other goodies

JView Pro is definitely an OS/2 product. It makes heavy use of threads. For example, file saves and image printing take place in a separate thread, so the user can proceed with other editing before the save is complete.

Printed output is very flexible. You can specify virtually any page dimensions to which the image will be stretched or shrunk to fit. And if you have a PostScript printer, you can bypass the OS/2 print system and create PostScript or Encapsulated PostScript output directly.

The icing on the cake is JView's support of REXX scripts. JView includes several REXX functions, including the ability to open, close, and save images, as well as the ability

to perform modifications such as crop, resize, and rotate. The JView-Iconify function will help you write a simple script that creates thumbnails for each image you have.

Glee or flee

For its function, compared to products like Impos/2 and Colorworks Pro, JView is priced about right. Crunch Products certainly couldn't charge more without adding scanner support. The only reason I hesitate at the current price is the technical support. Admittedly, I caught Crunch Products during a move to a new location, so some disruption is understandable. But if a company is going to move to a commercial product, at commercial prices, it should be ready to offer business-level technical support.

Nevertheless, JView is a great product, with lots of function, offered at a fair price.

NeuralCrunch/2 2.06

In the 1970s, Prolog was the tool of choice for those exploring artificial intelligence. Its subject predicate orientation was designed to simulate the thought processes that humans use to make decisions. It quickly became clear, however, that only the most powerful computers could hope to wade through the series of small decisions needed to arrive at a conclusion in a reasonable time frame. Simultaneously, scientists began to realize that our brains work very differently from computers. The billions of neurons in our brains are elaborately interconnected. To simulate that properly, then, we needed to change the way computers worked. NeuralCrunch/2 represents just such a tool.

Neural networks are hardware and/or software systems that simulate the interconnections of our brain. The networks are composed of inputs, interconnected nodes (simulated neurons), and outputs. Rather than programming neural networks with rigorous instructions that are followed sequentially like a C++ program, neural networks are "trained," just as humans are trained to perform specific tasks. When a network is first created, the nodes are assigned initial

input and output coefficients, as well as a bias amount. The input coefficients are typically random values; bias and output coefficients are calculated as a function of the input coefficient. As input is received at a node, these coefficient values determine how that input is changed before being passed as output from this node and input to other connected nodes. NeuralCrunch/2 uses a modified Newton-Raphson algorithm, with line-searching and backtracking to evaluate the coefficients in a multilayered feedforward network. (For an in-depth discussion of what is going on and how neural networks can be used to model everything from chaos theory to financial markets—perhaps not terribly dissimilar topics—the user manual includes a good bibliography.)

Training the network consists of providing a set of data from known situations as input, with the known results of those situations as the expected output if the model is correct. The network then processes the input, comparing its output to the known correct output. The node coefficients are adjusted to bring the output more in tune with the known correct output, and the process is repeated over and over until the network's output falls within a specified error tolerance of the target output. For more efficient convergence, NeuralCrunch/2 allows input and output coefficients to be trained separately.

Debugging such a system is quite a different story. It's more a matter of monitoring the training errors and the extent to which the targets and output match. To help that process, NeuralCrunch/2 provides a variety of views into the network. The default view graphically illustrates how close the network's output lines up with the provided target output. Other views allow you to see the coefficients and biases at each node, the specific responses from each node in the network, and the inputs to each node.

As the number of training iterations increases, the view can become

rather busy. NeuralCrunch/2 allows you to zoom in and scroll through the data for more precise analysis in nearly all views. You can also perform *annealing*, the process of introducing gradually decreasing amounts of random noise in the data to prevent extreme values from skewing coefficients. Both training and annealing can be fine-tuned by the user.

Another view shows you the dependencies in your network, that is, the overall effect each input has on the output. This view can be extremely enlightening in models. If you're attempting to model the stock market, for example, and you discover that the overall average for all issues is heavily influenced by the selling price of IBM stock, you might see OS/2 in a much more significant light.

Data is provided to NeuralCrunch/2 in the form of an ASCII text file containing space-delimited columns of numbers. Each record is a single sample, and each column represents one of the inputs into the network. Exponential notation (for example, 2.563e-3) is used for extremely large or small values.

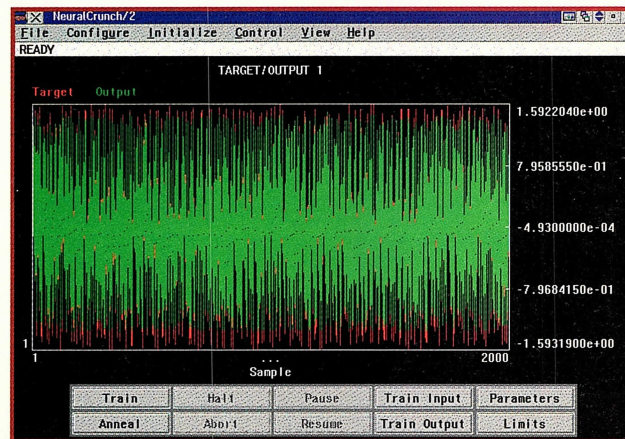


Figure 2: NeuralCrunch/2 visually maps target vs. actual output.

NeuralCrunch/2 allows you to set the number of inputs, nodes, and targets to essentially any value, although the more nodes you configure, the slower the training process becomes. A multithreaded operating system such as OS/2 is a prerequisite for a product like this one. NeuralCrunch/2 takes advantage of threads

to perform the intense computations in the background while maintaining responsiveness to the user.

Once you've trained a network, you then use NeuralCrunch/2's evaluation function to apply the network to a new set of data. That's, of course, a true test of your model's predictive abilities.

Glee or flee

Clearly, NeuralCrunch/2 is not your standard business application. (Nor is it packaged as one. The documentation isn't flashy, but it is complete.) But for those interested in neural network experimentation and a level of complex-system modeling not available with any other type of tool, NeuralCrunch/2 is a straightforward and powerful product.

QuickMotion 1.0

This is one of those products that is actually quite difficult for a reviewer. You see, there really aren't a lot of bells and whistles about which I can wax poetic for several paragraphs. Not that QuickMotion doesn't have a lot of function—it does. It's just that there isn't a lot that the user needs to (or is able to) worry about here. The product simply works.

The problem

QuickTime movies have been popular for years on the Macintosh and have made some inroads on PCs as well. They're the format used by several software packages, and they have become even more popular as a vehicle for sending video over the Internet. But there has not been a native OS/2 player for these files, usually having names ending in .qt or .mov. Windows players

have worked in Win-OS/2 sessions to some extent, but the video is usually jerky, and the sound may frequently be interrupted.

QuickMotion provides an OS/2-specific solution. Practice Corp. has, in fact, taken advantage of MMPM/2's abilities so well that once you've installed QuickMotion you probably

Test Drives

won't even realize it isn't an integral part of OS/2. The Digital Video program in the Multimedia folder, the Multimedia Viewer applet in the Bonus Pak, and the viewer component of the Video IN program in the BonusPak are all now able to run QuickTime movies with no additional effort required. That ability also carries forward to new digital video applications written to the MMPM/2 specifications including MultiMedia OpenDoc parts.

Viewing movies from the Internet

The WebExplorer is already set up to accept QuickTime movies. But for some reason, IBM chose to associate them with the optional Multimedia Viewer applet contained in the BonusPak. Because a perfectly good

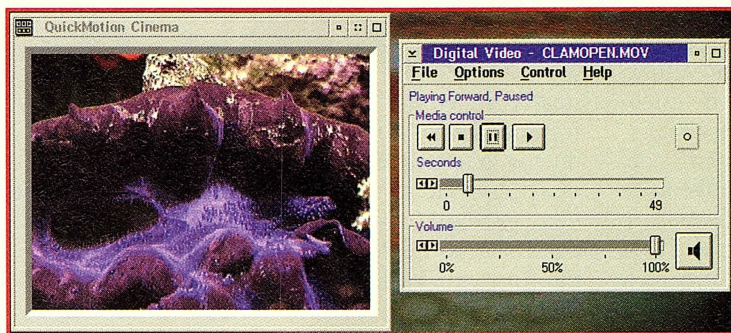


Figure 3: QuickMotion integrates with the multimedia viewer applets.

Digital Video program is installed as part of MMPM/2, many people didn't bother installing that applet. And even if you did, that program is a viewer only—it doesn't allow you to save the movie you just viewed to your disk.

If you haven't installed the Multimedia Viewer, or if you want to be able to save movies, I suggest you reconfigure WebExplorer to use the Digital Video program. From the WebExplorer menu, click on Configure/

Performance

I mentioned earlier that this is definitely OS/2-specific code. It takes advantage of OS/2's 32-bit memory model and multithreading to provide smooth performance. Of course, full-motion video with synchronized sound is one of the most stressful tests of a system, and your mileage will vary depending on the processor, memory, hard disk, and video card you are using. The online documentation for QuickMotion is quite sparse,

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Test Drives

but it does include some good performance tips for tuning digital video. It briefly discusses several options you can add to your *config.sys* file.

Restrictions

QuickMotion supports playback only. The Video IN component does not gain the ability to capture QuickTime movies. It also doesn't support some of the more advanced options that QuickTime offers, but those features aren't in widespread use anyway. Practice Corp. promises continuing updates to address these features. You should check its Web site for the latest information, as well as links to some interesting sites containing QuickTime movies.

Glee or flee

Your need for QuickMotion will be entirely dictated by the way you use your computer. If you're simply running business applications, of course, you'll probably never need it. But if you're surfing the net, you may come

across several interesting sites that have movies in QuickTime format. Judging by conversations in online forums, I suspect the site with hundreds of megabytes of Star Trek and other science fiction footage archived in QuickTime format (<http://www.univ-rennes1.fr/ASTRO/anim-enf.html>, if you must know) would be one of great interest to many Warped people. QuickMotion seems rather high-priced for the casual user, but then many games cost even more these days. 

Brian Proffit left IBM's OS/2 team to become director of PC Week's Corporate Labs. Now president of Visionary Research, senior contributing editor for OS/2 Magazine, and solutions advisor to PC Magazine, he can be reached at 75300.1466@compuserve.com.

Resources:

JView Pro 1.0a

(\$119; nonprofessional version, \$49)

Crunch Products

(510) 655-7898

E-mail 702564.2343@compuserve.com

READER SERVICE NO. 106

NeuralCrunch/2

(\$49.95)

Grace Pacific Numerics

(619) 688-1532

E-mail dgrace@sprynet.com

READER SERVICE NO. 107

QuickMotion 1.0

(\$49.95)

Practice Corporation

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WWW <http://www.practice.xo.com>

Portele Systemsoftware, Germany

E-mail portele@rbg.informatik.th-darmstadt.de

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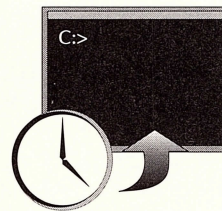
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Reader Service No. 18



Customizing Your Latest OS/2 Install

BY DICK GORAN

How many times have you considered reinstalling OS/2, but thought to yourself, Argh, another customization? In previous issues, I have described changing certain Workplace Shell objects via a REXX program ("Where Goest My TrueType Fonts?" December 1995, pp. 75-78; "LaunchPad Revisited," June 1996, pp. 62-65) In fact, many of the values you use to customize your system after an OS/2 install can be set using a REXX program.

I have a set of programs that I call SysGen01, SysGen02, and so on, that I run after I have completed the OS/2 installation process. The function of each of these programs relies on the preceding program in the group having been run. Some of the programs in the series can be run at any time after the install is completed and are used to update my system. For example, SysGen04 is the program that builds my customized LaunchPad. I run this program any time I want to recreate the LaunchPad, not just after a new install. Because my purpose here is to make it easier for you to customize your individual systems, just making my SysGen programs available would not serve any useful end. Rather, I intend to show you how to build your own.

OS/2 Warp Connect and OS/2 Warp Server, along with the rise of notebook use, have expanded the number of multiple computer users. To make these utility tools usable from one system to another, I have introduced my own environment variable, `MACHINE_NAME`, in each of my `config.sys` files. This modification allows me to determine on which of my computers my programs are run-

ning. You can let your imagination wander in selecting names for your systems. The built-in `VALUE()` function is used in REXX to interrogate the

value of an environment variable. In the case of the machine name, I use:

```
GBL.machine_name = VALUE( _
```

Fragment 1: Background color setup.

```
GBL.boot_drive = LEFT( VALUE( 'RUNWORKPLACE',,, _
    'OS2ENVIRONMENT' ), 2 )
GBL.machine_name = VALUE( ' MACHINE_NAME',,, 'OS2ENVIRONMENT' )
select
  when GBL.machine_name = 'AST01' then
    do
      TAPCIS_drive = 'C:'
      WP51_drive   = 'C:'
      WP61_drive   = 'C:'
      XTALK_drive  = 'C:'
      if GBL.boot_drive = 'D:' then
        do
          /* Warp Connect */
          red   = 128
          green = 255
          blue  = 255
          background_setup_string =,
            '(none),,,C,' red green blue
        end
      if GBL.boot_drive = 'F:' then
        do
          /* Merlin */
          red   = 0
          green = 255
          blue  = 255
          background_setup_string =,
            '(none),,,C,' red green blue
        end
      end
    when GBL.machine_name = 'SABER' then
      do
        /* customized for SABER */
      end
    otherwise
      do
        say '   Unknown MACHINE_NAME value of' GBL.machine_name
        exit
      end
end

desktop_setup_string =,
  'BACKGROUND=' || background_setup_string

call SysSetObjectData desktop_id,,
  desktop_setup_string
```

cont'd on p. 57


```
'MACHINE_NAME,, '
'OS2ENVIRONMENT' )
```

I use GBL as a stem or compound variable in my REXX programs to indicate variables that I can expose by exposing the stem of GBL.

The first of the series of programs you create should be a one-time use program that will do any desired cleanup from the install, along with creating Desktop folders that you would normally create with drag and drop. The second task is easier than the first. Part of what I refer to as cleanup includes tasks such as setting your Desktop background color or image. On my primary computer I have copies of OS/2 Warp without Windows (red box), OS/2 Warp with WIN-OS2 (blue box), a small OS/2 Warp maintenance partition, and OS/2 Warp Connect. I use a different color on each Desktop so I have a quick visual indication of which system is running.

I have two folders on my Desktop named OS/2 Applications and DOS Applications, respectively. Each is used to hold miscellaneous program objects and folders that I use frequently and that don't necessarily justify having their own container. I also keep a folder on my Desktop for my FTPPM objects, and I create a folder to contain all of the objects that OS/2 Warp Connect strews across my Desktop. Fragment 1 shows an example of the code I use to set the Desktop background colors and to assign some program paths to variables for each computer. Fragment 2 contains the setup strings used to create the four folders. The icons that are referenced in this code fragment are images, which I have collected, that I like on my Desktop. You can remove the ICONFILE and ICONNFILE statements or replace the icon file names with images of your choice.

Some of the other settings that I used to find annoying every time I installed a new copy of OS/2 are related to the Confirmation entries found in the System Setup folder and the Keyboard object. You can use one of the INI display utilities like LISTINI to

Fragment 1: Cont'd from p. 56.

```
if RESULT = 1 then
do
say ' Desktop background has been set'
end
else
do
say ' Unable to set Desktop background'
exit
end
```

Fragment 2: Folder setup.

```
OS2_misc_folder_ID = '<Misc OS/2 Applications>'
DOS_misc_folder_ID = '<Misc DOS Applications>'
INTERNET_misc_folder_ID = '<Misc Internet Objects>'
CONNECT_misc_folder_ID = '<Misc Connect Objects>'

OS2_program_folder_class = 'WPFolder'
OS2_program_folder_title = 'OS/2^Applications'
OS2_program_folder_location = '<WP_DESKTOP>'
OS2_program_folder_setup_string = ,
'TITLE=' || OS2_program_folder_title || ';' || ,
'ICONFILE=' || GBL.program_path || 'SYSGEN_0.ICO;' || ,
'ICONNFILE=1,' || GBL.program_path || 'SYSGEN_0.ICO;' || ,
'ICONVIEW=FLOWED,NORMAL;' || ,
'ALWAYSSORT=YES;' || ,
'OBJECTID=' || OS2_misc_folder_ID || ';' || ,
''
call SyscreateObject OS2_program_folder_class,,
OS2_program_folder_title,,
OS2_program_folder_location,,
OS2_program_folder_setup_string,,
'UPDATE'

if RESULT = 1 then
do
say ' Unable to create ' || OS2_program_folder_title
end

DOS_program_folder_class = 'WPFolder'
DOS_program_folder_title = 'DOS^Applications'
DOS_program_folder_location = '<WP_DESKTOP>'
DOS_program_folder_setup_string = ,
'TITLE=' || DOS_program_folder_title || ';' || ,
'ICONFILE=' || GBL.program_path || 'SYSGEN_D.ICO;' || ,
'ICONNFILE=1,' || GBL.program_path || 'SYSGEN_D.ICO;' || ,
'ICONVIEW=FLOWED,NORMAL;' || ,
'ALWAYSSORT=YES;' || ,
'OBJECTID=' || DOS_misc_folder_ID || ';' || ,
''
call SyscreateObject DOS_program_folder_class,,
DOS_program_folder_title,,
DOS_program_folder_location,,
DOS_program_folder_setup_string,,
'UPDATE'

if RESULT = 1 then
do
say ' Unable to create ' || DOS_program_folder_title
end

INTERNET_program_folder_class = 'WPFolder'
INTERNET_program_folder_title = 'Internet^Objects'
INTERNET_program_folder_location = '<WP_DESKTOP>'
INTERNET_program_folder_setup_string = ,
'TITLE=' || INTERNET_program_folder_title || ';' || ,
```

cont'd on p. 58

see what your entries are. The **PM_Control** stanza in the *os2.ini* file contains the entries that you might want to set in SysGen01. Fragment 3 contains the **PM_Control** values that I obtained by listing my *os2.ini* file. Unfortunately, **PM_Control** keys are not included in the *.ini* file unless they have been changed from their default value.

Including a complete copy of my SysGen01 program would exceed the space limitations of this column. However, it is available via anonymous FTP as *sysgen01.zip*. The copy on our FTP server is not intended to be run on any other system. I am making it available only as an example.

Additional functions included in my SysGen01 include: setting the properties of all of the folders created by the install; building the four folders referenced above and creating the specific VDMs that I need for the few DOS programs I keep on the system; moving the Internet Access Kit (IAK) objects that are left on the Desktop by the installation into a single folder; and adding appropriate programs to the Startup folder.

With a little planning, and by keeping careful notes about the tasks you perform when installing a fresh copy of OS/2, you can build a list of the tasks you want to perform in your own series of SysGen programs. **OS/2**

Dick Goran is the author of The REXX Reference Summary Handbook, an OS/2 reference. He has been in the computer industry since 1961 and was in the IBM mainframe systems software development business until 1987. He teaches OS/2 REXX to corporate clients and lectures on OS/2. His free REXX utility programs can be downloaded from OS2DF1, Lib 6 on CompuServe or FTPed from <ftp://ftp.cfsrex.com/pub>. He can be reached via e-mail at 71154.2002@compuserve.com.

Resources:

listini.zip

Free for download from <ftp.cfsrex.com/pub>

sysgen01.zip

Free for download from <ftp.cfsrex.com/pub>

Fragment 2: Cont'd from p. 57.

```
'ICONFILE='      || GBL.program_path || 'SYSGEN_I.ICO;' ||,
'ICONNFIL=1,'    || GBL.program_path || 'SYSGEN_I.ICO;' ||,
'ICONVIEW=FLOWED,NORMAL;'      ||,
'ALWAYSSORT=YES;'                ||,
'OBJECTID='      || INTERNET_misc_folder_ID || ';'      ||,
''

call SyscreateObject INTERNET_program_folder_class,,
                     INTERNET_program_folder_title,,
                     INTERNET_program_folder_location,,
                     INTERNET_program_folder_setup_string,,
                     'UPDATE'

if RESULT = 1 then
do
    say '    Unable to create ' || INTERNET_program_folder_title
end

CONNECT_program_folder_class = 'WPFolder'
CONNECT_program_folder_title = 'Warp^Connect'
CONNECT_program_folder_location = '<WP_DESKTOP>'
CONNECT_program_folder_setup_string =,
'TITLE='      || CONNECT_program_folder_title || ';' ||,
'ICONFILE='   || GBL.program_path || 'SYSGEN_C.ICO;' ||,
'ICONNFIL=1,' || GBL.program_path || 'SYSGEN_C.ICO;' ||,
'ICONVIEW=FLOWED,NORMAL;'      ||,
'ALWAYSSORT=YES;'                ||,
'OBJECTID='   || CONNECT_misc_folder_ID || ';'      ||,
''

if GBL.warp_peer = '' then
do
    call SyscreateObject CONNECT_program_folder_class,,
                     CONNECT_program_folder_title,,
                     CONNECT_program_folder_location,,
                     CONNECT_program_folder_setup_string,,
                     'UPDATE'

    if RESULT = 1 then
do
        say '    Unable to create ' ||
CONNECT_program_folder_title
end
end

end
```

Fragment 3: PM_Control setup.

```
app_name = 'PM_ControlPanel'
s=0
s=s+1; setting.s = 'Animation' COPIES( '00'x, 3 )
s=s+1; setting.s = 'ConfirmCopyMoveEtc' '0'
s=s+1; setting.s = 'ConfirmDelete' '0'
s=s+1; setting.s = 'ConfirmRenameFilesWithExt' '0'
s=s+1; setting.s = 'ConfirmSubDelete' '1'
s=s+1; setting.s = 'CursorBlinkRate' '500'
s=s+1; setting.s = 'DisplayProgressInd' '1'
s=s+1; setting.s = 'KeyRepeatDelay' '0'
s=s+1; setting.s = 'KeyRepeatRate' '20'
s=s+1; setting.s = 'LockStartInput' '010000'x
s=s+1; setting.s = 'LogoDisplayTime' '2000'
setting.0 = s
do s = 1 to setting.0
    parse value setting.s with,
        key_name,
        key_value
    key_value = STRIP( key_value )
    call SysIni 'USER', app_name, key_name, key_value || '00'x
    if RESULT = 'ERROR:' then
do
        say '    Error setting' key_name 'to' key_value 'in'
app_name
end
end

end
```


Want to run OS/2 SMP on your desktop? Want to run it *fast*? The "Double Shot" from Diamond Flower International fills both orders for not as much money as you might think. For a street price of a little more than \$3,800 (available through Indelible Blue) the DFI Double Shot comes with a dual 166MHz Pentium configuration with 32MB of DRAM, 6x CD-ROM drive, 512KB Pipeline Burst cache, 64-bit Amazon PCI video card, 1.6GB EIDE hard drive, and room for seven half-height devices.

If you already have a system, then you might want to consider upgrading by purchasing just the motherboard itself, which costs about \$210 (no processors included, non-EDO memory support). Either way, the Double Shot allows you to grow in capability for quite some time. Let's look at it more closely to see why.

Motherboard

The Double Shot is based upon the G586VPM Rev. C+ motherboard. Unlike the Rev. B stepping of this series, the Rev. C+ supports EDO (Extended Data Out) memory. This support gives the motherboard a performance advantage over its non-EDO counterparts. In addition, the motherboard operates in any of 22 memory configurations, from as little as 4MB to a whopping 512MB on the board itself. Considering that many systems sold today come with as little as 8MB of memory and a high end around 32MB (some Pentium Pro's are sold with 64MB of memory), addressing enough memory should not be an issue with the Rev. C+.

With selectable clocking, the motherboard is capable of supporting one or two Pentium processors, from 75MHz all the way to 166MHz. Such configurability allows the system to grow with your budgetary needs and computing requirements—just add or change a processor as needed.

One real advantage is that the G586VPM motherboard's BIOS comes on Flash EPROM. The benefit is BIOS upgradability without the need to purchase another motherboard or BIOS chip. A simple software utility provides the needed facilities to

change the BIOS, thus preserving your hardware investment. This feature will become more important when Intel introduces yet another Baskin-Robbins' CPU Frequency of the Month, or makes some subtle change to an existing processor line that requires a tweak to the BIOS code.

As for peripheral support, the G586VPM motherboard has built-in fast serial ports (16550 compatible), a smart parallel port (SPP/EPP/ECP), a floppy drive controller, a mini-DIN-6 connector for a PS/2 style mouse, and two bus-mastered PCI IDE connectors. The IDE connectors allow control of up to four IDE drives (including CD-ROM) and will support IDE drives larger than 528MB. The only PC card you really need to buy to make a basic system run is a video card—everything else is there.

Speaking of PC cards, the G586VPM motherboard has four PCI slots and four ISA slots. Because the serial, parallel, mouse, and IDE controllers are already on the motherboard, there is plenty of room for other devices to be included, such as sound cards, SCSI controllers, data-acquisition boards, custom hardware, and so on.

With regards to the ISA cards' slots: The CPU ZIF (zero insertion force) sockets are directly behind the ISA slots. While you can add full-length PCI cards (not many are around, but they do exist), you cannot do so with the ISA slots. With one CPU installed (on the far back), ISA card lengths are limited to two-thirds of their full size. With two CPUs installed, the limitation is half-size cards before contending with the heatsink of the second CPU. Consider this limitation if you have a long ISA PC card you can't live without.

The G586VPM motherboard provides several cache configurations (256KB at 32-bits wide, 512KB at 32-bits wide, 512KB at 64-bits wide, and 1MB at 64-bits wide). Depending on the type of cache card loaded, you can select between Asynchronous or Pipeline Burst cache. The type of cache you select must match the cache card in the motherboard.

Video card

The video card provided in the DFI

Double Shot is a DFI Amazon 64 4MB PCI video card, based upon the Weitek P9100 GUI accelerator and P9130 video coprocessor. These chips and the 4MB of memory give video resolutions up to 1600x1200 (at 64K colors), with true color at resolutions up to 1280x1024.

The Amazon 64 comes with a set of six disks containing drivers for OS/2 2.x and OS/2 Warp, Windows 3.11, Windows 95, DOS, CAD, and Microsoft Video for Windows. The OS/2 utility (which has its own folder) allows you to quickly select the resolution and vertical frequency if you want to change the display. Once you have selected a new display setting, you still need to go through the shutdown/reboot process familiar to OS/2 users.

To truly appreciate all that this video card can deliver, you need high resolution and a large monitor, or really good rendered animation. Even if you don't have either, the card performs very fast at all resolutions tested (up to 1280x1024).

CD-ROM

The CR-600 CD-ROM that came with the system is a SANYO-built IDE unit that provides 6x speed. Transfer rates sit at 900KB/sec, with access times around 230ms. The access time is a little slower than some other IDE CD-ROMs in the 4x category, but is not apparent due to the faster transfer rate, which more than makes up for it. Loading large programs, like Colorworks, goes very quickly.

One interesting wrinkle concerns IDE CD-ROM support and OS/2. If you are loading and using OS/2 Warp, then the IDE support for the CD-ROM is built in and should run without a hitch. In the older versions (2.11 and 2.11 for SMP), retrieving and replacing the following four files is necessary: *ibmidecd.flt*, *ibm1s506.add*, *os2cdrom.dmd*, and *os2dasd.dmd*—dated 5-4-95, with previous versions dated 2-13-95. According to DFI technical support, the older drivers will work with the IDE drives, while the newer ones won't. This fact proved true during testing. You can get these files from DFI's BBS at (908) 390-4820.

Review

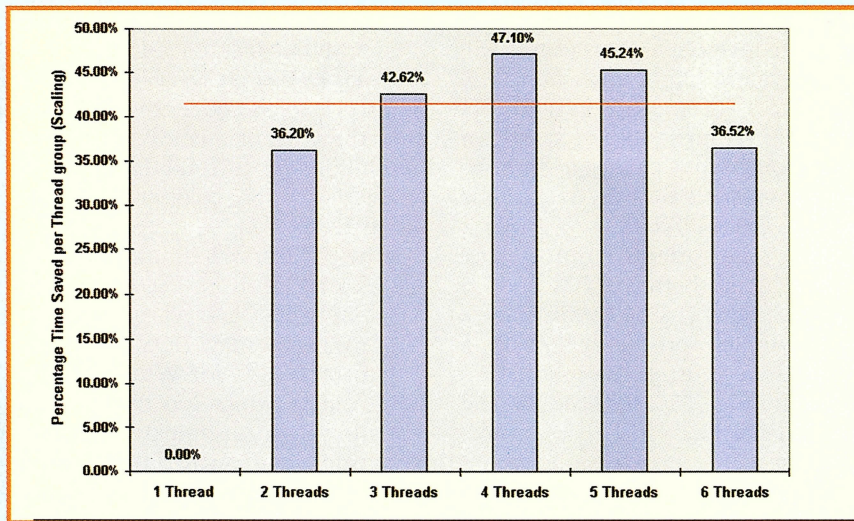


Figure 1: OS/2 SMP performance scaling; high I/O load test; two CPUs.

Hard drive

A Western Digital Caviar 31600 EIDE hard drive comes with the Double Shot. With 1.6GB and a 3.5-inch form factor, the Caviar drive takes up little space, but is quite roomy and fast when it comes to applications.

Two more IDE devices (tape drives, hard drives, and so on) can be added to the DFI Double Shot before all IDE channels are full. If this limitation concerns you, or you need better disk I/O performance, then you need to consider using SCSI.

Miscellaneous

The case that houses the Double Shot has some advantages and a quirk or two.

Disassembly is a breeze, with both side panels and the top disengaging from the chassis, making servicing a snap. DFI lowered the inside top platform of the chassis to make room for two 3.5-inch devices. In this case, it was the floppy and the WD hard drive. So, when you take the top off, you have the hard drive and floppy right there for servicing, and the rest of the box stays sealed up. A very nice feature.

The side panels make it easy to access the PC cards, motherboard, and hard-drive chassis on the inside.

The internal hard-drive chassis can support five devices in the main bay, with the 3.5-inch slot above it in the top, and a 3.5-inch bay screw mounted below it. This maximizes

drive space. If you need to add memory in banks 3 or 4, then the seventh bay should be removed, as it blocks part of the space required by memory SIMM modules.

Performance

The DFI Double Shot lives up to its billing on two counts: usability performance and SMP performance.

Usability. Perception is reality when it comes to performance. To some, a system runs blindingly fast, while to others, it takes too long to do the job. Be that as it may, the Double Shot is a pleasure to use. Remember, I'm talking about OS/2 2.11 for SMP here. The interface isn't as nice or as responsive as OS/2 Warp's.

The added horsepower makes itself known once you start launching programs from Presentation Manager. Large programs, such as Colorworks, come up very quickly and stay responsive, even with several other tasks running in the background.

As part of the testing, I originally had planned to use Colorworks to run some application loading on both processors. I set up a series of simple special effects to be applied to images and then timed the results. After a while I surrendered. Colorworks ran too fast to make any of the timings meaningful in context.

SMP performance. The true measure of the usefulness of that second processor is how well, timewise, an application will scale when com-

pared against another application running on a single processor. The big lie is that two processors mean twice as fast. Not so. There is no guarantee that you will see improved application performance with more than one processor.

With that in mind, let's see how the DFI Double Shot performed as configured and then address the issues that impact SMP performance in general and that can be applied to the DFI system.

As you can see in Figure 1, the time savings averaged just a little over 40% for multiple copies of a test running on both CPUs. Could the DFI Double Shot have done better? Possibly. The biggest impediment to the Double Shot's performance was the IDE hard drive.

The test run was designed to create a worst-case scenario. The disk was to be frequently accessed, and the data blocks used were large enough to force the CPU to use its secondary cache often, so the application ran at its slowest, or close to it. If the tests were nothing more than tight loops of calculations run in memory, then the numbers would look much different. Are these test cases real? To an extent, they are. It all depends on the type of application you run.

In the real world, your mileage will vary greatly. For example, if you have an application that is SMP-aware and can spread itself out over all processors, like ColorWorks, then your time savings will be greater than an application without these capabilities. Also, if your application is small, you might not save much time—there may only be a few seconds difference.

What you will find is a mixture of results. The bottom line has to be "Did I save myself enough time that it was worth it?"

Performance issues

The two greatest drawbacks on SMP performance (in the PC world) center on disk I/O and caching. Usually it's one or the other. Rarely is it both unless the hardware manufacturer has done a poor job of design and integration. Obviously, a system costing under \$5,000 is not likely to outperform a \$15,000 system, but the

can get close enough that the price differential does not warrant the extra expense for the high-end machine.

Fast disks

Fast disks are spelled S. C. S. I. Here's why in a nutshell.

IDE and EIDE are serial-type devices that depend on the CPU to run them. When you access an IDE drive, the system CPU has to stop and do all the housekeeping for the drive, as well as fetch the data. SCSI drives, on the other hand, depend on CPU-based controller cards to handle all these tasks. The main CPU hands off the disk I/O request to the controller and then goes on its merry way to do other things while the request is in process. In fact, the CPU can hand off multiple requests for multiple SCSI devices and go on without waiting, since the SCSI controller uses an interleaving technique to handle all requests. What this means, on the surface, is more efficient use of CPU time—hence, faster performance. But, that's not the biggie.

The biggest difference between IDE and SCSI is in the transfer rate. IDE and EIDE drives are limited in their transfer rates compared to SCSI. Realistically, given today's fast drives, you can see transfers rates up to several MB per second. That's fast. However, SCSI devices can easily make 20MB/sec transfer rates, and some claim to go even higher. That's lightning fast. The more expensive SMP-based systems all use SCSI for these very reasons.

What does this mean for your application? The less time spent at the disk drive, the faster the application will run.

The DFI Double Shot is positioned to take advantage of fast SCSI devices because of its PCI bus. The bus can handle data rates up to 140MB/sec, which is more than enough to deal with a 20MB/sec SCSI controller. Connect a fast SCSI controller (such as an Adaptec 2940), plus a fast SCSI drive, and watch the difference.

Quick cache lesson

Caches are some of the least understood but more critical pieces that influence how fast your software will perform.

Intel uses two types of caching to create fast-performing CPU/system combinations. They are generally referred to as the L-1 (internal to the CPU) and L-2 (on the motherboard) caches. We can't do anything about the internal cache, so we will ignore that, but the external cache has some flexibility.

When an Intel CPU runs a program, it keeps old instructions and data laying around in the internal cache in case it needs them again. Thus, the CPU doesn't have to fetch this information from memory, thereby allowing it to run more efficiently. If the CPU needs an instruction or a piece of data that it can't find in the internal cache, it pokes around in the external cache looking for it. If the CPU finds what it's looking for, it can go on about its business and save itself time by not having to go out to slower main memory to get what it needs.

Now, the fun really begins when you have two or more CPUs sharing the same cache. Chances are very good that neither CPU is running the same set of code, thus each CPU places into the cache its own unique set of data and instructions. When the cache fills up and the CPU that wants to use the cache can't find what it wants, it flushes the whole cache and loads new data and instructions. The second CPU comes along and sees that everything that it squirreled away for later has been discarded. It proceeds to flush the cache and reload it with the data and instructions it wants. Thus begins the vicious battle between two CPUs for control of the cache space (known as cache-thrashing). If the problem becomes severe enough, one CPU will stall, waiting on the other to finish playing with the cache before doing the same thing itself. The net result is a loss of performance, and each CPU burns time flushing and reloading the cache instead of doing useful computations.

On far more expensive systems, the external cache is split, with each section dedicated to a particular CPU. This reduces cache contention, by removing CPU competition for the same space. It does not, however, remove the issue of cache-thrashing

based upon too small a cache size. Generally speaking, that is not a problem in these systems.

A second issue of cache performance centers around the "size" of the data that is fetched from the cache. Pentiums are 64-bit CPUs. They run fastest when they can receive data that way. By using small data sizes, the CPU has to execute more fetches to get the information it needs. More work fetching data means more time spent doing so, which translates into a slower running program.

The DFI Double Shot is unique among many of its peers in that it offers a selectable data size (32- or 64-bit). If you have the right size of cache, using 64-bit data sizes will help your cache and CPU perform more efficiently.

Conclusion

The DFI Double Shot is a well thought out, low-priced SMP system that can provide a long-term solution to many computing needs. With much of the basic PC system support on the motherboard, the bus is open to add hardware cards for several different kinds of tasks without running out of slots too soon. The case is one of the best I have seen for access and serviceability. If you don't need a whole system, you can still benefit from just the purchase of the motherboard.

The Double Shot is not for everyone, but if you are an OS/2 power user, it will be much appreciated. **OS/2**

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Resources:

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READER SERVICE NO. 103

Hardware hates me. I can make a computer system crash just by standing next to it. Plus, it's guaranteed to fail in the most obscure manner, which no technician can possibly reproduce.

Perhaps that's why, like many of you, I've collected a "tool box" full of diagnostic software to help me figure out what's wrong with a recalcitrant system. I just examined DiagSoft's QAPLus/2, and I think it's a keeper.

Diagnostic software isn't performance software. QAPLus/2 won't tell you about the speed of a hard disk or video card. Its job is to tell you if the equipment works—or, when it doesn't work, exactly what failed and why.

I bought the DOS version of QAPLus when it was first available, and it helped me troubleshoot systems reliably for several years. So I admit to being predisposed to enjoy the company's OS/2 version.

QAPLus/2 installed on my system without fanfare. The installation does put a driver in the *config.sys*, so you have to reboot before you use the software. Ordinarily, I wouldn't quibble about a simple reboot, but I've worked on too much borderline hardware for which rebooting is an iffy proposition. While I understand that diagnostic software needs to collect system information, I wish the company had found a way to accomplish data-gathering without requiring a system shutdown.

What does it test?

QAPLus/2 tests the major subsystems

of your desktop or laptop. The big-ticket item, of course, is the system board; the software looks at it, as well as at your RAM, video card, serial and parallel ports, mouse, and keyboards. Drives aren't overlooked, as QAPLus/2 looks at floppy, hard disk, and CD-ROM drives.

The program stresses some component tests more than others. In particular, it emphasizes memory tests, including a full 32-bit RAM test (up to 64MB RAM) and includes a SIMM locator to help you identify which memory board is malfunctioning. QAPLus/2 also includes a quick system test, presumably meant for manufacturers that want to verify that a computer is working before it goes out the door.

You should also know what QAPLus/2 *doesn't* examine. For one thing, it won't test for IRQ conflicts, and it doesn't do anything with network cards and multimedia hardware (such as sound cards). While this deficiency might be disappointing, unlimited evaluations are probably too much to ask of any diagnostic software that has to operate within the confines of the operating system (that is to say, OS/2 won't let QAPLus/2 peek under the covers). However, QAPLus/2 will report system information, such as CMOS data and a hardware summary. It doesn't merely ask the BIOS to report what equipment it thinks it has—BIOS can lie—but gets that information by querying OS/2. The reports provide much of the same information you

would get by running RMVIEW, but with the benefit of a useful log that can be stored with a given computer.

Everything worked fine on my computer. I was particularly impressed with how well the program multitasks the various testing operations. QAPLus/2 really does test the RAM while it tests the hard disk while it tests the system board. Because a thorough diagnostic session can take some time, the multithreading really makes a difference—it works quickly and well. Logging can be turned on or off manually; my only criticism is that you must turn logging off before viewing the report file.

My own system has been reasonably fine-tuned, and all of the pieces work. So it came as no surprise that QAPLus/2 appeared problem-free. But how often do you perform diagnostics on a computer that's behaving itself? You buy this kind of application to use on the systems that don't work. So I went in search of a few problem machines.

Looking for trouble

A client called to say that a computer was running poorly. It was a 66MHz 486DX2-based system with 16MB RAM; however OS/2 Warp Connect was running sluggishly, as if it were on a machine with only a 386 processor and half the memory. Because I wanted to give QAPLus/2 a workout, I dare say this is the only time I have ever cheered when a client reported malfunctioning hardware. But I found myself disappointed; QAPLus/2's installation went fine, but the software wouldn't run.

I called DiagSoft's technical support and, while waiting for them to call me back (which they did in a timely fashion), figured out that QAPLus/2 was looking for DLLs associated with OS/2's multimedia software support. Apparently, the utility was written and tested only on systems with sound cards—this computer didn't have a sound card. Technical support was friendly about the issue, but couldn't offer any immediate assistance other than to suggest I selectively install multimedia software support. (You can do so without multimedia hardware, and the program

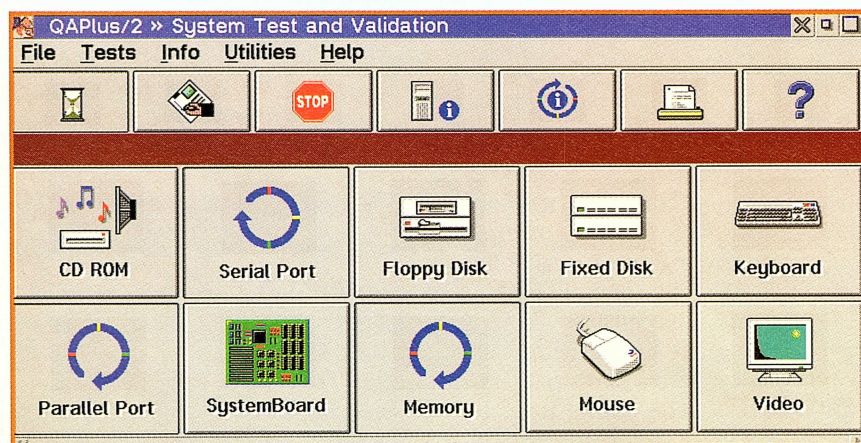


Figure 1: QAPLus/2's user interface is straightforward, with pop-up help that makes it easy to understand what each icon represents.



Figure 2: Each hardware component has several tests associated with it. Settings can be stored and re-used.

does run.) This work-around was successful but shouldn't have been necessary. Alas, by the time we resolved the multimedia DLL issue, we had (manually) fixed the system.

So, we tried QAPLUS/2 on a couple of other machines. In one, where the system had mysterious Trap errors at random times, QAPLUS/2 reported (in one out of about 10 tests) that it found an undefinable error on the system board. Useful, but not very useful.

For my third test, I decided to give the utility a real challenge. I put together a computer composed of the several "iffy" components that have found themselves permanent places in my garage. I used a 60MHz Pentium-based system old enough to have, among other things, three PCI slots on the same interrupt; it's never worked quite right since the day I got it. I then installed two PCI cards to determine what sort of conflict it could generate. I installed a multimedia card but gave it an incorrect address. Plus, I put a SCSI hard disk on the system that I knew was headed south; when it was last installed on a production system, OS/2 would run fine for a few days and then unaccountably crash in a SCSI driver, usually taking the system partition along with it.

QAPLUS/2 performed admirably. While it didn't notice any problems with the multimedia card (unsurprising, since OS/2 didn't load the driver when the card didn't respond at the

right addresses), it spotted everything else. QAPLUS/2 reported a system board problem (which might or might not be related to the PCI conflict; I couldn't tell). It also complained bitterly about the hard disk and reported exactly which tracks failed its tests. If I hadn't known what was wrong with this system before I started, QAPLUS/2 would have given me more than adequate direction for troubleshooting.

The "quick system test" didn't report any problems, however. I don't know how much faith I'd put in such a test, unless it's just a quick check to verify that everything is plugged in correctly.

Useful for a toolbox

Ordinarily, buying diagnostic software is about as exciting as getting a new set of tires. But when it can help you get a computer working again, the utility's floppy disks might as well be made out of gold. QAPLUS/2 does the job it promises, and it does a good job. Clearly, this utility won't solve every problem you might encounter, but it can help pinpoint the source of hardware problems.

If you own only one or two modern PCs, you might spend the \$129.95 and never use the software. In that case, you might want to think

twice. But if your job requires end-user support or systems configuration, or if you're a consultant, or are even just the friendly guru who likes to help other people fix their problems, you'll want to have QAPLUS/2 in your software toolbox. **OS/2**

Esther Schindler is a computer consultant and writer. She is a senior contributing editor to OS/2 Magazine, the sysop of ZDnet Executives On-Line Forum on CompuServe, and co-author of Teach Yourself REXX in 21 Days, from Sams Publishing. You can contact her at 72241.1417@compuserve.com.

Resources:

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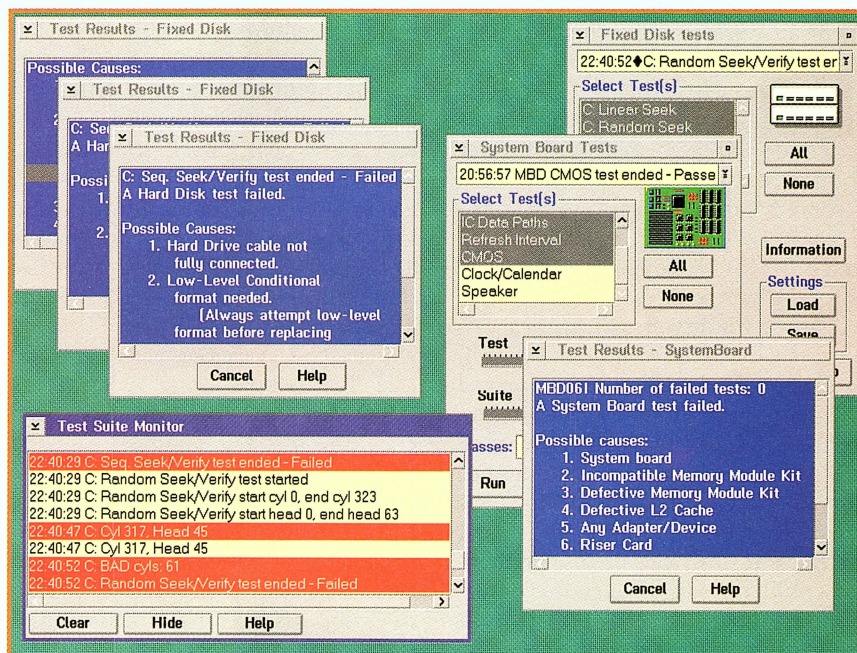


Figure 3: When a component fails, QAPLUS/2 gives you detailed information about how and why.



This LAN is My LAN, This LAN is Your LAN

BY STAN KELLY-BOOTLE

A part from all the terrible puns, of which Atari's PromisedLAN takes the biscuit (indeed, some think it triggered divine retribution), the local area network seems to me to be one of computerdom's most persistent *bêtes noires*. I don't mean those inaccessible beasts that lurk inside our *boîtes noires*. Black boxes, by definition, hide their internal implementational horrors, promoting the key slogan of technological progress: "Out of sight, out of mind!" The LAN nightmare, however, arises from the glut of volatile skulduggery that cannot be hidden and must be mastered to preserve the users' sanity. You can usually spot the LAN administrators at a conference by their tics and twitches. They are also the ones who, having spent all week trying to interconnect three identical PCs, scream hysterically whenever a speaker mentions "seamless interoperability across heterogeneous platforms." Cynics are fond of explaining that *net* means "reduced," as in *net pay*, and of defining a network as an antisyncretic assembly of systems divided by a common protocol.

Part of the reason is historical. To borrow Churchill's comment on golf, the PC-based LAN is a "game played with singularly inappropriate implements." Successive generations of protocols, network operating systems, and interface cards cannot escape the burdens of DOS 1.0 and the earliest NetBIOS. It's this decade of incremental cobbling, with everyone determined to maintain past and present compatibility with everyone else, that makes the LAN scene so difficult to

follow. On the other hand, it is a major and growing market we cannot ignore, and one in which IBM, Microsoft, Novell, and the usual UNIX suspects are fighting desperately for mind and dollar share. Novell's ancient Netware still has the edge in absolute numbers installed, but mainly as a file and printer server. In the booming client/server and Web server domains, Netware is fading fast as NT grows.

Regular OS/2 Magazine readers will be aware that IBM's latest weapon is OS/2 Warp Server 4.0, launched to counter Microsoft's Windows NT Server 4. The marketing genius of Bill Gates is unbounded. Having spent billions on the Win95 rollout, he elected to release the new NT with a muted stealth that immediately grabbed the world's headlines.

As I write, there's no book covering all the nuances of this battle, but I can strongly recommend *The IBM LAN Server Source Book—How to Connect Your Business at Warp Speed* by Pat Scherer and Charlie Brown (John Wilie & Sons, 1996, \$34.95, ISBN 0-471-13170-9). Both authors work for IBM and played leading roles in the development of LAN Server 4.0, upon which OS/2 Warp Server 4.0 is based (see "In the Box," June 1996, p. 26). If you are new to the LAN experience, the first two chapters will lead you as gently as possible into the concepts and acronymically infested terminology. You will learn that *requester* is simply an annoying IBM synonym for *client*. Chapter 3 outlines the history of the various versions of LAN Server from 1.0 to 4.0 and of OS/2 Warp Connect (which

includes the client components of LAN Server 4.0), together with sections on Complementary Products and Future Directions. It's here that one's eyes begin to glaze over a tad when confronted with the combinatorial explosion of add-ons, plug-ins, Entry and Advanced versions, and so on. I was tickled to see that the Remote LAN Access package includes a Distributed Console Access Facility, dubbed DECAF long before Java hit the stove.

The remaining 11 chapters cover the nuts and bolts of installing, configuring, and trouble-shooting the LAN Server. Appendix A provides a price/feature comparison of LAN Server 4.0, Novell's NetWare 4.1, and Windows NT 3.5. No doubt the next edition will cover NT Server 4. I have a minor quibble with the way the final glossary is organized. The acronym IPL is not expanded in the text and does not have an entry in the index. The entry in the glossary is "Initial Program Load (IPL)," which presupposes a familiarity with the acronym for which you are searching. Far outweighing this tiny peeve is my delight with the authors' eclectic quotations that lead off each chapter.

OS/2

Stan has been exposed to computing (and vice versa) since the EDSAC I of the 1950s. His latest book is The Computer Contradictionary (MIT Press, 1995). He welcomes e-mail via skb@crl.com. Visit his Web page at <http://www.crl.com/~skb>.

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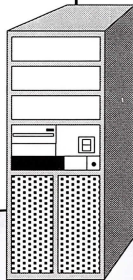
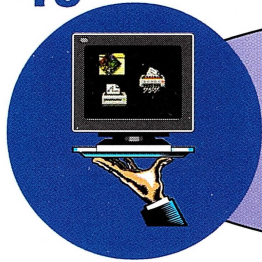
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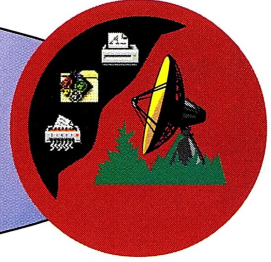
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